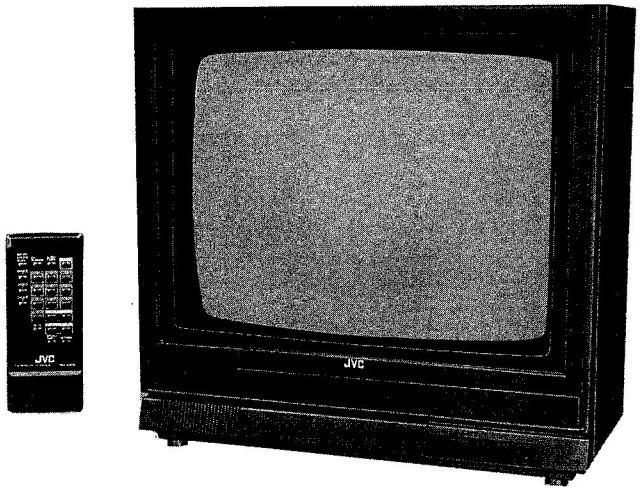
JVC

SERVICE MANUAL

20" COLOR TV

MODEL C-1936 (CA)



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* With SCHEMATIC DIAGRAM and SERVICE ADJUSTMENT (NTSC)

- BASIC CHASSIS : FX CHASSIS
- SAME TYPE MODEL
  C-1926/C-1465/C-2065/C-2055/C-1950

SPECIFICATIONS (Design and specifications subject to change without notice)

Dimension : 51.0 cm(W) × 50.5 cm(D) × 49.3 cm(H)
Weight : 20.7kg
GND : HOT CHASSIS (LIVE SIDE GND. ONLY)
TV System and Color System
VHF/UHF ..... CCIR(M), NTSC
TV Receiving Channels and Frequency
VL Band (02ch~06ch) ..... 54 MHz~88 MHz
VH Band (07ch~13ch) ..... 174 MHz~216 MHz
UHF Band (14ch~69ch) ..... 470 MHz~806 MHz
CATV Receiving Channel and Frequency
(128CH. Quartz Synthesizer System)
Low Band (2~6, A-8~A-6) (02~06 & 01, 93, 94) .....
High Band (7~13) by (07~13) .....
Mid Band (A~I) by (14~22) .....
Super Band (J~W) by (23~36) .....
Hyper Band (W+1~W+29) by (37~65) ..
Sub Mid Band (A-5~A-1) by (95~99) ...
} 54 MHz~474 MHz

On Screen Channel Indicator ..... 02~13, 14~69ch (TV)
01~65, 93~99ch (CATV)
Intermediate Frequency
Video IF Carrier ..... 45.75 MHz
Sound IF Carrier ..... 41.25 MHz (4.5 MHz)
Color Sub Carrier ..... 3.58 MHz
ANT. Input Impedance ..... 75 Ω Unbalanced (VHF)
300 Ω Balanced (UHF)
Power Input ..... AC120 V, 60 Hz
Power Consumption 1.4A
Picture Tube ..... 20", In-line type
Viewable Picture Size ..... 40.4 cm (W) × 30.3 cm (H)
High Voltage ..... 28 kV ±1 kV (at zero beam current)
Speaker ..... 8 cm, Round type, 8 Ω
Audio Power Output ..... 1.5 W
Tube 1
Transistor ..... 27 (In TV), 2 (In remocon)
IC ..... 11 (In TV), 1 (In remocon)

No. 5815
Apr. 1986

■ SAFETY PRECAUTION

As for safety precautions including electric shock prevention, use of designated components, or safety inspection after servicing, refer to the appended NTSC.

1. FEATURES

- Adopts IC's into which video, sync., chroma circuits are one-pack incorporated.
- Adopts microcomputer IC's for DC controls of sound volume, channels ..,.. etc.
- On screen display of TV/CATV channel, sound volume and sleep timer.
- With sleep timer for 30 minutes, 60 minutes, 90 minutes and 120 minutes by on-screen display.
- Multi-function remote-control device facilitates control of channel, power, sound volume, sleep timer, on-screen, choice, return ch. & mute ..... etc.
- PLL circuit permits receiving TV/CATV stations that total to maximum 128 channels.

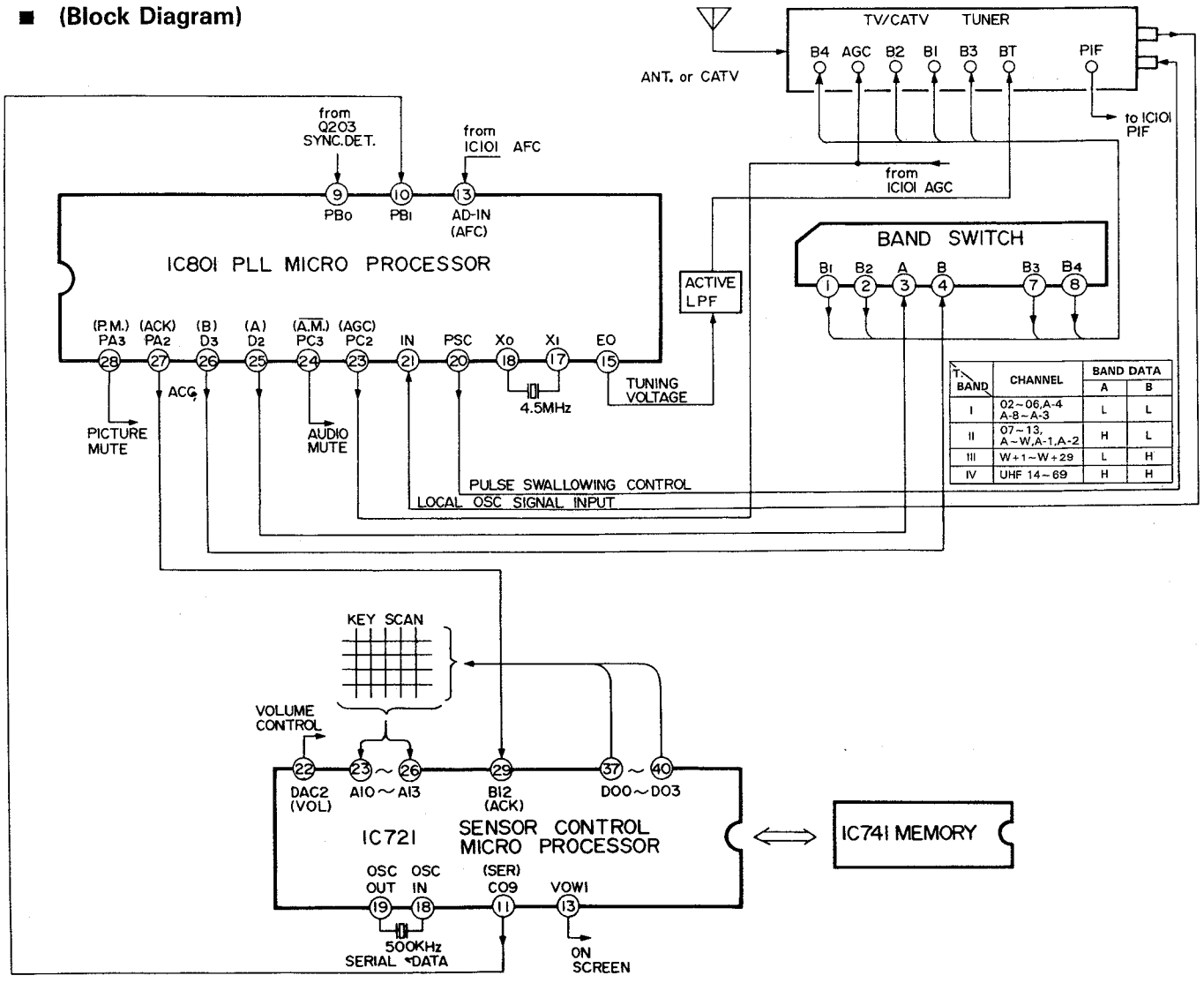
2. OUTLINE

■ This TV control part is composed of 4 bit-microprocessor μPD1709C in one chip for digital tuning, into which PLL and the controller are packed, and sensor control microprocessor MN14831JTZ in couples for controlling such as selection circuit, on-screen, sound volume.

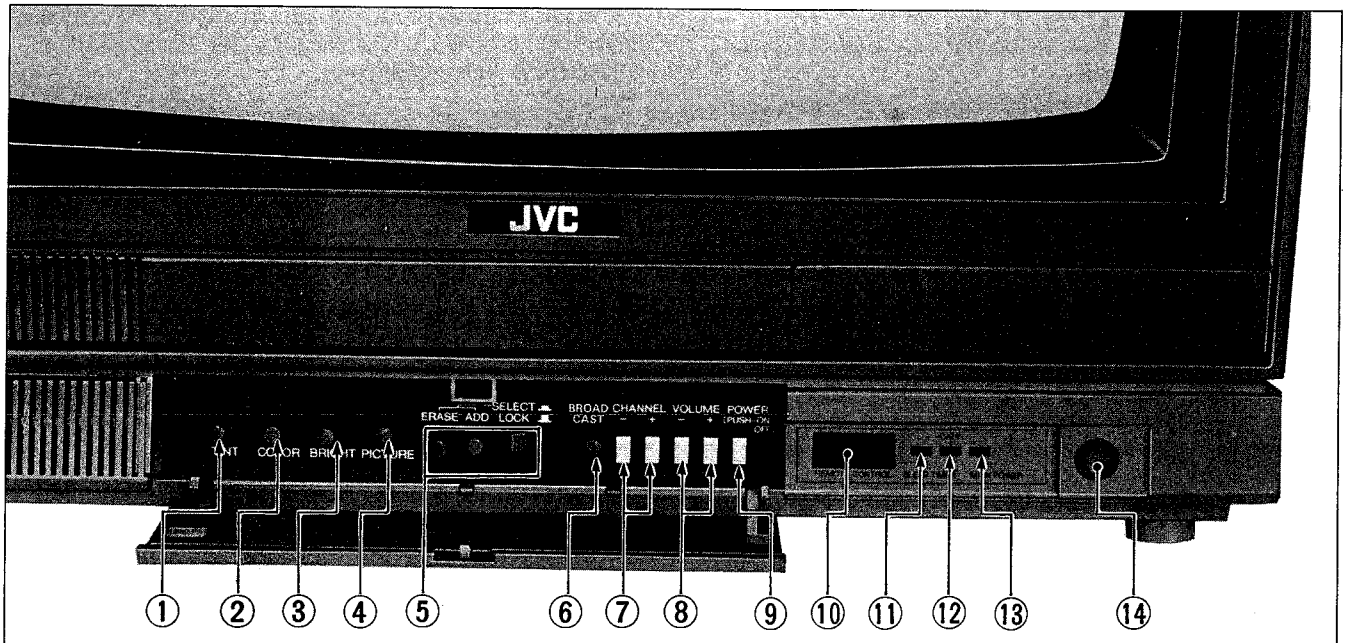
■ PLL MICROPROCESSOR

- 4 bit-microprocessor for digital tuning
- Built-in PLL and controller
- Program memory (ROM) ..... 16 bits ×1526 steps
- Data-memory (RAM) ..... 4 bits × 64 words
- Built-in 4 bit A/D converter.
- Adopts PULSE SWALLOW system that permits high-precision AFC with high frequency.

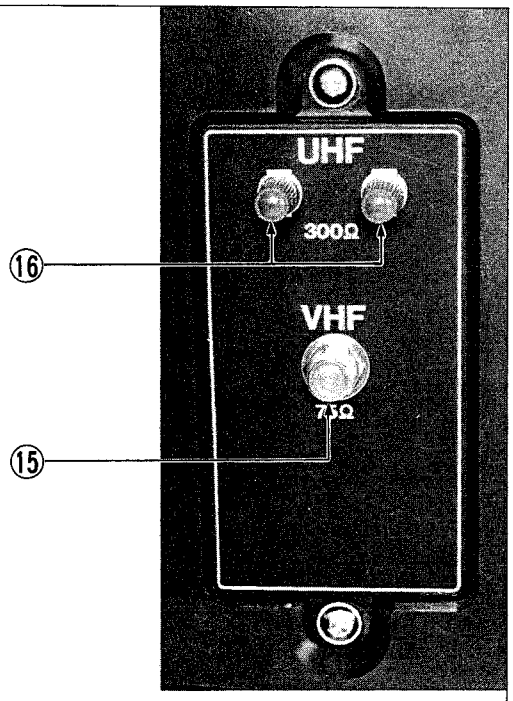
■ (Block Diagram)


TV/CATV TUNER
B4 AGC B2 B1 B3 BT PIF
ANT. or CATV
to IC101 PIF
from IC101 AGC
from Q203 SYNC.DET.
from IC101 AFC
9 10 13
PB0 PB1 AD-IN (AFC)
IC801 PLL MICRO PROCESSOR
BAND SWITCH
B1 B2 A B B3 B4
1 2 3 4 7 8
ACTIVE LPF
(P.M.) PA3 (ACK) PA2 (B) D3 (A) D2 (A.M.) PC3 (AGC) PC2 IN PSC Xo XI EO
28 27 26 25 24 23 21 20 18 17 15
ACC
4.5MHz
TUNING VOLTAGE
PICTURE MUTE
AUDIO MUTE
PULSE SWALLOWING CONTROL
LOCAL OSC SIGNAL INPUT
T. BAND | CHANNEL | BAND DATA A | B
I | 02~06,A-4 A-8~A-3 | L | L
II | 07~13, A~W,A-1,A-2 | H | L
III | W+1~W+29 | L | H
IV | UHF 14~69 | H | H
KEY SCAN
VOLUME CONTROL
22 23~26 29 37~40
DAC2 (VOL) AI0~AI3 BI2 (ACK) DO0~DO3
IC721 SENSOR CONTROL MICRO PROCESSOR
IC741 MEMORY
OSC OUT OSC IN (SER) CO9 VOW1
19 18 11 13
500KHz SERIAL DATA
ON SCREEN

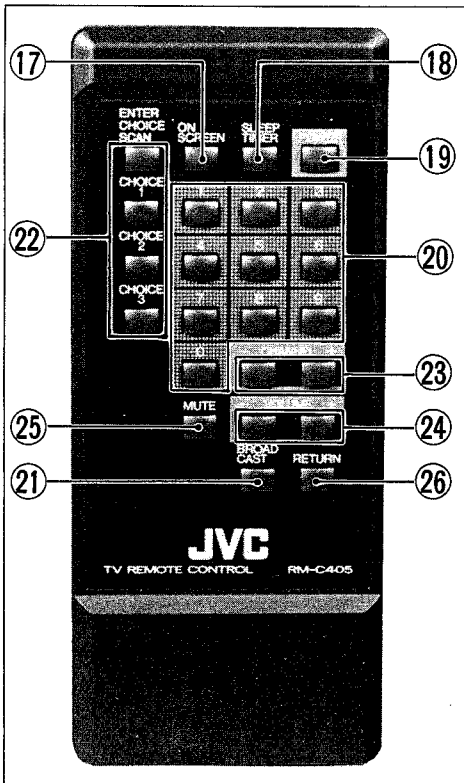
3. FUNCTIONS



① TINT CONTROL
② COLOR CONTROL
③ BRIGHT CONTROL
④ PICTURE CONTROL
⑤ ERASE/ADD. AND SELECT/LOCK BUTTON
⑥ BROADCAST BUTTON
⑦ CHANNEL UP-DOWN BUTTON
⑧ VOLUME UP-DOWN BUTTON
⑨ POWER BUTTON
⑩ REMOCON WINDOW
⑪ SLEEP TIMER INDICATOR
⑫ CATV INDICATOR
⑬ MAIN POWER INDICATOR
⑭ MAIN POWER BUTTON



⑮ VHF ANT. TERMINAL
⑯ UHF ANT. TERMINAL



⑰ ON SCREEN BUTTON
⑱ SLEEP TIMER BUTTON
⑲ POWER BUTTON
⑳ DIRECT CHANNEL SELECTOR BUTTON
㉑ BROADCAST BUTTON
㉒ ENTER/CHOISE(1～3)/SCAN BUTTON
㉓ CHANNEL UP-DOWN BUTTON
㉔ VOL. UP-DOWN BUTTON
㉕ MUTE BUTTON
㉖ RETURN BUTTON

⑤ ERASE/ADD. AND SELECT/LOCK BUTTON

- **Select/lock button**

1. When this button is set to SELECT side, ADD and ERASE operations are possible.
2. When this button is set to LOCK, the added broadcasting stations except erased broadcasting stations are broadcasted.

* Set this button to LOCK generally.

- **Added button**
  Set SELECT/LOCK button to SELECT side and choose broadcasting stations to be locked by pressing ADD button. Then CH. mode and "_" among CH. NOs are displayed by pressing ADD button.
- **Erase button**
  When any broadcasting stations selected by setting SELECT/LOCK button to SELECT side are unwanted, these stations are erased from locked channels. CH. mode and "_" among CH. NOs disappear.

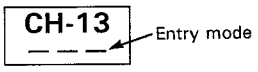
⑱ SLEEP TIMER (Remocon)

This time turns a TV set in operation into STAND-BY MODE automatically at a fixed time. The timer each of 30 min. 60 min. 90 min. 120 min. is possible. When the rest of a fixed time is necessary on the way after fixing a sleep timer, it is displayed on-screen for about 3 seconds by pressing SLEEP TIMER button.

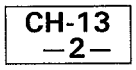
㉒ ENTER/CHOICE/SCAN BUTTON (Remocon)

- **How to set choice channel**

1. Select channels liked to set.
2. Press the ENTER CHOISE SCAN button.
   Then the present channel and "———" are displayed ON-SCREEN to show an entry mode (Right figure). This continues for about five seconds.



3. Press the CHOICE BUTTON (CHOICE 1~3) while "———" is displayed. Then the CHOICE channel number set is displayed in the center of "———", and "–2–" flashes to show a finished set (Right figure).

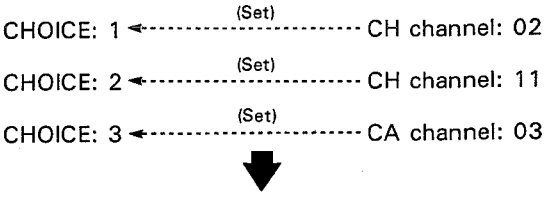


4. Finishing Set
   In the example, CH-13 has been set for CHOICE 2.

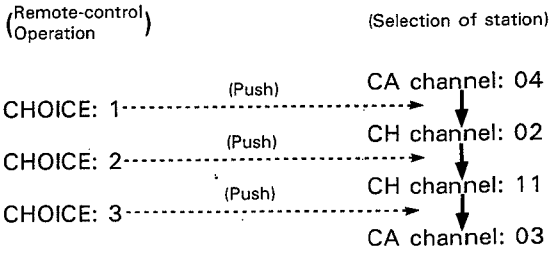
- **How to use choice channel**

The CHOICE channel button (1~3) on remote-control device facilitates receiving one's channels set (memorized) for CHOICE channels beforehand.
[Example]

* Choice channel setting (memorize)



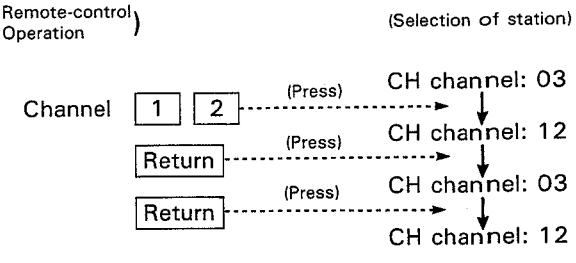
* Choice channel operation by remote-control.



- **How to set autochannel-up operation**
  While ENTER display "———" is on-screen by pressing ENTER/CHOICE/SCAN button, AUTO CHANNEL UP operation is done by pressing CHANNEL UP (+) button. This button channels up all the added channels one after another in one of CH. & CA. models. When all CHANNEL UP operation is over, ENTER display "———" shows an end.
  * If necessary to stop AUTO CHANNEL UP operation, it stops by pressing other button than CHANNEL UP BUTTON.

㉖ RETURN CHANNEL (Remocon)

The return channel button on remote-control device permits receiving pictures from the channel received before.
[Example]



4. SERVICE ADJUSTMENTS

* Use isolation transformer when repairing. (See: Safety precaution).

Regarding general or chroma adjustments, refer to the appended NTSC.
As for the test points and respective volume adjusting positions, refer to the schematic diagram and the section on "alignment locations" appearing in the same diagram.
As to the following items, observe the respective instructions given herein.

■ B1 VOLTAGE

Confirm that voltage between TP-91 and the earth is 129 V.

NOTE

The tester used should be periodically calibrated at 20 kΩ/V.

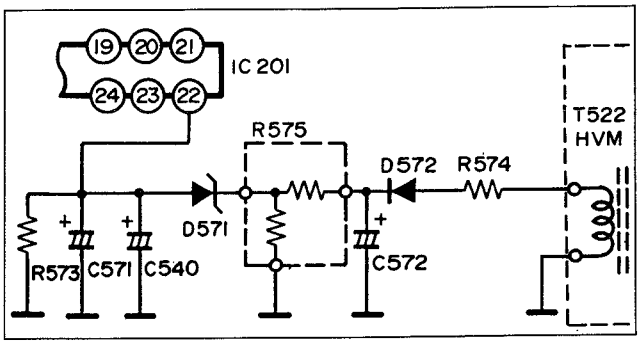
■ HOW TO CHECK THE HIGH VOLTAGE HOLD DOWN CIRCUIT

- High voltage hold down circuit.
  After repair of the high voltage hold down circuit shown in figure, this circuit shall be checked to operate collectly.
- Checking method of the high voltage hold down circuit.

1. Make the short circuiting across the R905, 160Ω 25 W UNF R (See: Page 11, View No. ㊱), under normal operating condition.
2. Confirm the picture goes out.

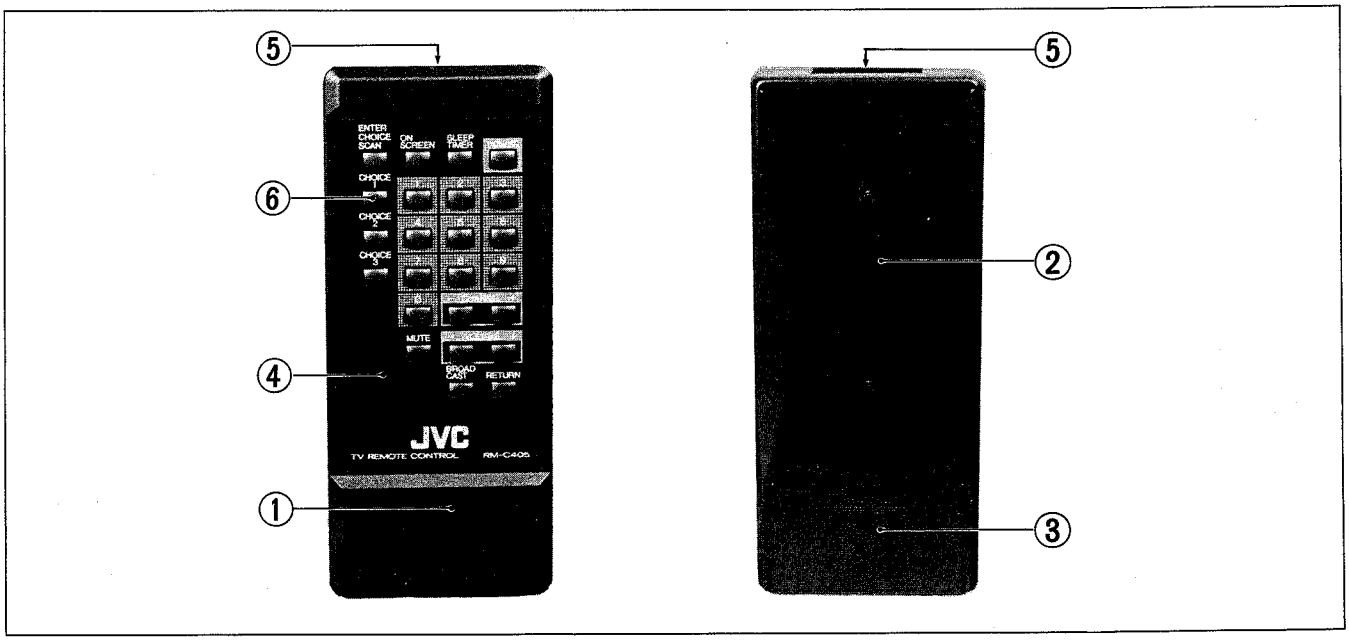
■ NOTICE FOR APPENDED NTSC.

Some item of adjustment method is not applicable to some model.
In such a case omit the item.



5. REPLACEMENT PARTS LIST

(RM-C405 REMOTE CONTROL TRANSMITTER)



(REMOTE CONTROL TRANSMITTER PARTS LIST)

VIEW No.	SYMBOL No.	⚠	PART No.	PART NAME	REMARK
1			UR64CS119	Front Case	
2			UR64CS120	Bottom Case	
3			UR64EC121	Battery Cover	
4			UR64PP137B	Panel	
5			UR64SB125	Filter	
6			UR64BT123B	Button	

SX-1152A (MAIN P.B. ASS'Y)

SYMBOL No.	⚠	PART No.	PART NAME	REMARK
VARIABLE RESISTOR				
R1104		**CEX40197-014**	VR	10kΩ B (Noise)
R1230		**QVCA002-CB14M**	〃	〃 B (Bright)
R1231		**CEX40197-023**	〃	2kΩ B (Sub Bright)
R1240		**QVCA002-CB14M**	〃	10kΩ B (Picture)
R1241		**CEX40197-014**	〃	〃 B (Sub Picture)
R1330		**QVCA002-CB14M**	〃	〃 B (Tint)
R1333		〃 **-CB14M**	〃	〃 B (Color)
R1341		**CEX40197-014**	〃	〃 B (Sub Tint)
R1342		〃 **-014**	〃	〃 B (Sub Color)
R1404		〃 **-013**	〃	1kΩ B (V. Height)
R1723		**CEX40202-023**	〃	2kΩ B (CLK)
RESISTOR				
R1001	⚠	QRD149J-5R6S	CR	5.6Ω 1/4W J
R1116	⚠	〃 -100S	〃	10Ω 〃 〃
R1410	⚠	QRX019J-3R3S	MF R	3.3Ω 1W 〃
R1509		QRG029J-153A	OM R	15kΩ 2W 〃
R1516		〃 -153A	〃	〃 〃 〃
R1520	⚠	QRD149J-1R0S	CR	1Ω 1/4W 〃
R1524	⚠	QRG039J-682A	OM R	6.8kΩ 3W 〃
R1526		QRG019J-472S	〃	4.7kΩ 1W 〃
R1531	⚠	QRX029J-5R6	MF R	5.6Ω 2W 〃
R1533	⚠	〃 -5R6A	〃	〃 〃 〃
R1534	⚠	〃 -5R6A	〃	〃 〃 〃
R1535		QRG019J-121S	OM R	120Ω 1W 〃
R1536		QRG029J-681A	〃	680Ω 2W 〃
R1551	⚠	QRG019J-102S	〃	1kΩ 1W 〃
R1574	⚠	QRX019J-4R7S	MF R	4.7Ω 〃 〃
R1575	⚠	CJ39622-00A	R Block	
R1753		QRG019J-682S	OM R	6.8kΩ 1W J
R1836		QRG029J-153A	〃	15kΩ 2W 〃
R1837		QRG019J-123S	〃	12kΩ 1W 〃
R1840	⚠	〃 -101S	〃	100Ω 〃 〃
R1841		〃 -123S	〃	12kΩ 〃 〃
R1901	⚠	QRF076K-2R0	UNF R	2Ω 7W K
R1904	⚠	QRD129J-123S	CR	12kΩ 1/2W J
R1907	⚠	QRX029J-2R2A	MF R	2.2Ω 2W 〃
R1908	⚠	QRD149J-221S	CR	220Ω 1/4W 〃
R1921	⚠	〃 -102S	〃	1kΩ 〃
R1924	⚠	QRG039J-102A	OM R	〃 3W 〃
R1925	⚠	〃 -102A	〃	〃 〃 〃
R1927	⚠	QRD149J-102S	CR	〃 1/4W 〃
CAPACITOR				
C1110		QCT25CH-121Z	C Cap.	120pF 50V J
C1111		〃 -180	〃	18pF 〃 〃
C1113		QEC01HM-474MZ	E Cap.	0.47μF 〃 M
C1115		QEM51CK-476M	〃	47μF 16V K
C1201		QEN61HM-475Z	BP E Cap.	4.7μF 50V M
C1208		QETB1CM-228	E Cap.	220μF 16V 〃
C1306		QFZ0083-104MZ	M Cap.	0.1μF 50V K
C1308		QEN51HM-335	BP E Cap.	3.3μF 〃 M
C1401		QFV81HJ-124M	TF Cap.	0.12μF 〃 J
C1403		QEE51VK-684M	Tan. Cap.	0.68μF 35V K
C1423		QEH51HM-107M	E Cap.	100μF 50V M
C1426		QFV71HJ-104MZ	TF Cap.	0.1μF 〃 J
C1507		QFP31HG-272S	PP Cap.	2700pF 〃 G
C1509		QETB1CM-227	E Cap.	220μF 16V M
C1523	⚠	QET52CR-336	E Cap.	33μF 160V R
C1526	⚠	QFZ0081-8801S	MPP Cap.	8800pF 1600V ±3%
C1527		QET52CR-475	E Cap.	4.7μF 160V R
C1529		QFZ0067-474S	MPP Cap.	0.47μF 200V K
C1531		QETB1VM-227	E Cap.	220μF 35V M
C1533		QEH51HM-107M	〃	100μF 50V 〃
C1534		QEH51EM-107M	〃	〃 25V 〃
C1551		QEH62AM-105MZ	E Cap.	1μF 100V M
C1621		QET52AR-106	〃	10μF 〃 R
C1622	⚠	QET52AR-106	〃	〃 〃 〃
C1624	⚠	〃 -106	〃	〃 〃 〃
C1625	⚠	QET62CR-105Z	〃	1μF 160V 〃
C1628		QET52CR-475	〃	4.7μF 〃 〃
C1629		QET52CR-475	E Cap.	4.7μF 160V R
C1802		QEB61HM-104MZ	E Cap.	0.1μF 50V M
C1831		QFV81HJ-224M	TF Cap.	0.22μF 〃 J
C1835		QFZ0083-683MZ	M Cap.	0.068μF 〃 K
C1901	⚠	QCZ9025-472A	C Cap.	4700pF AC 125V Z
C1902	⚠	〃 -472A	〃	〃 〃 〃
C1903	⚠	〃 -472A	〃	〃 〃 〃
C1904	⚠	QEU72DM-567M	E Cap.	560μF 200V M
C1905	⚠	QFZ9025-104M	MF Cap.	0.1μF AC 125V M
C1906	⚠	〃 -104M	〃	〃 〃 〃
C1907		QET52CR-106	E Cap.	10μF 160V R
C1921		QET52ER-475	〃	4.7μF 250V 〃
TRANSFORMER				
T1102		A75899	CW Transf.	
T1103		A75588-B	AFC Transf.	
T1201		CE40619-00A	BP Transf.	
T1301		A75196	3.58 BP Transf.	
T1521		CEX40133	Hor Drive Transf.	
T1601		A75583	S take off Transf.	
T1602		CE40121-101	SIF Transf.	
T1621	⚠	C39130-A	S. O. Transf.	
T1781		CE40304-001	BP Transf.	
COIL				
L1102		A76186-1.0	Peaking Coil	1μH
L1103		〃 -15Z	〃	15μH
L1105		〃 -8.2Z	〃	8.2μH
L1120		CE40143-1R2	〃	1.2μH
L1201		CE40547-330	〃	33μH
L1202		〃 -121	〃	120μH
L1301		A76186-3.3Z	〃	3.3μH
L1303		〃 -15Z	〃	15μH
L1520	⚠	CJ39509-048	Choke Coil	
L1523		CE40037-111	HVT Choke	
L1524		〃 -111	〃	
L1601		A76186-22	Peaking Coil	22μH
L1721		A76186-2.2Z	〃	2.2μH
DIODE				
D1201~6		1SS133-Y	Si. Diode	
D1231		〃	〃	
D1241		〃	〃	
D1421		1SR35-100-Z	〃	
D1501		MA4120(M)-Y	Zener Diode	
D1521		RH-1B-Z	Si. Diode	
D1531	⚠	U19E-F	〃	
D1551		1SS81	〃	
D1571	⚠	HZ7B2LV1	Zener Diode	
D1572		1SS81	Si. Diode	
D1706		SEL1910D	LED	Sleep Timer Ind.
D1707,8		1SS133-Y	Si. Diode	
D1710		LN31GCP-UH	LED	CATV Ind.
D1712~17		1SS133-Y	Si. Diode	
D1720		〃	〃	
D1741		〃	〃	
D1751		MA4047(M,H)-Y	Zener Diode	
D1753		MA4270(M)-Y	〃	
D1761		1SS133-Y	Si. Diode	
D1762		1N34A-T	Ge. Diode	
D1781		PD49PI	Photo Diode	
D1791		1SS133-Y	Si. Diode	
D1801		〃	〃	
D1831		〃	〃	
D1832		〃	〃	

SYMBOL No.	⚠	PART No.	PART NAME	REMARK
D1833		MA4047(M,H)-Y	Zener Diode	
D1834		μPC574J(V)	IC/Zener Diode	
D1835		1SS133-Y	Si. Diode	
D1901	⚠	1S1887A-Z	〃	
D1902	⚠	〃	〃	
D1903	⚠	〃	〃	
D1904	⚠	〃	〃	
D1921	⚠	〃	〃	
D1922		1SS146-Y	〃	
D1923		GL-5PR2	LED	Main Power
D1924		RD12F(B1)	Zener Diode	
D1925	⚠	1S1887A-Z	Si. Diode	
TRANSISTOR				
Q1101		2SA1015(Y,GR)L	Si. Transistor	
Q1120		2SC1360	〃	
Q1201		2SA1015(Y,GR)L	〃	
Q1202		2SC1815(Y,GR)L	〃	
Q1203		2SB642(Q,R)	〃	
Q1204		2SA1015(Y,GR)L	〃	
Q1321		2SC1815(Y,GR)L	〃	
Q1521		2SC3187	〃	or 2SC2610BK
Q1522	⚠	2SD1555	〃	or 2SD1427
Q1721,22		2SC1815(Y,GR)L	〃	
Q1724		2SD637(Q,R)	〃	
Q1761		2SC1815(Y,GR)L	〃	
Q1762		2SA1015(Y,GR)L	〃	
Q1763,64		2SC1815(Y,GR)L	〃	
Q1765		2SA1015(Y,GR)L	〃	
Q1801,02		2SD637(Q,R)	〃	
Q1831		2SK105(F)	FET	
Q1832		2SD637(Q,R)	Si. Transistor	
Q1921,22		2SC3187	〃	
IC				
IC1101		TA7680AP	IC	
IC1201	⚠	μPC1401C	〃	
IC1421	⚠	AN5515	〃	
IC1721		MN14831JTZ	〃	
IC1741		MN1228	IC	
IC1742	⚠	TA78L005AP	〃	
IC1781		μPC1373H	〃	
IC1791		μPD4049UBC	〃	
IC1801		μPD1709C-538	〃	
IC1831		LA7910	〃	
IC1901	⚠	STK563A	〃	
OTHERS				
		A49647-C	Print Jack	
CF1101		CE40124-45A	Ceramic Trap	
CF1501		CSB503F2	Ceramic Resonat	
CF1601		A74603-C	Ceramic Filter	
CF1721		CSB500A	〃	
CP1501	⚠	ICP-F15	IC Protecter	
DL1201		CE40372-001	Delay Line	
F1901	⚠	QMF66U1-4R0S	Fuse	4A
F1902	⚠	QMF53U1-1R25S	〃	1.25A
LF1901	⚠	CE40248-00A	Line Filter	
P1101		CE40061-47C	Piezonator	
RY1921	⚠	CE40508-00B	Relay	
SF1101		CE40050-204	Saw Filter	
S1201		QSL4A13-C02	Lever Switch	Service Switch
S1701		QST3101-C03	Push Switch	Select/Lock
S1702		QSP4H11-C03	〃	Power
S1703		〃 -C03	〃	CH+
S1704		〃 -C03	〃	CH−
S1705		〃 -C03	〃	Vol+
S1706		〃 -C03	〃	Vol−
S1707		〃 -C03	〃	ADD
S1708		〃 -C03	〃	Erase
S1709		〃 -C03	〃	TV/CATV
S1901	⚠	**QSP4D11-C02**	Power Switch	Main Power
TH1901	⚠	A75414	Posistor	
UV1001	⚠	**AN7773EP-A04**	CATV Tuner	
X1301		A76351-D	Crystal	
X1801		CE40842-001	〃	

SX-3031A (CRT SOCKET P.B. ASS'Y)

SYMBOL No.	⚠	PART No.	PART NAME	REMARK
VARIABLE RESISTOR				
R3102		CEX40202-053	VR	5kΩ B (G. Cutoff)
R3104		〃 -053	〃	〃 B (R. Cutoff)
R3106		〃 -053	〃	〃 B (B. Cutoff)
R3108		〃 -022	〃	200Ω B (G. Drive)
R3110		〃 -022	〃	〃 B (R. Drive)
RESISTOR				
R3113~15	⚠	QRG029J-123	OM R	12kΩ 2W J
R3120,22		QRZ0039-332	Comp. R	3.3kΩ 1/2W K
R3121		QRZ0039-392	Comp. R	3.9kΩ 〃 〃
CAPACITOR				
C3105		QFH53BK-223M	MM Cap.	0.022μF 1250V K
COIL				
L3101		QQL043K-181	Peaking Coil	180μH
TRANSISTOR				
Q3101~3		2SC1514VC	Si. Transistor	
Q3104		2SC3187	〃	
OTHERS				
	⚠	A75522-D	CRT Socket	

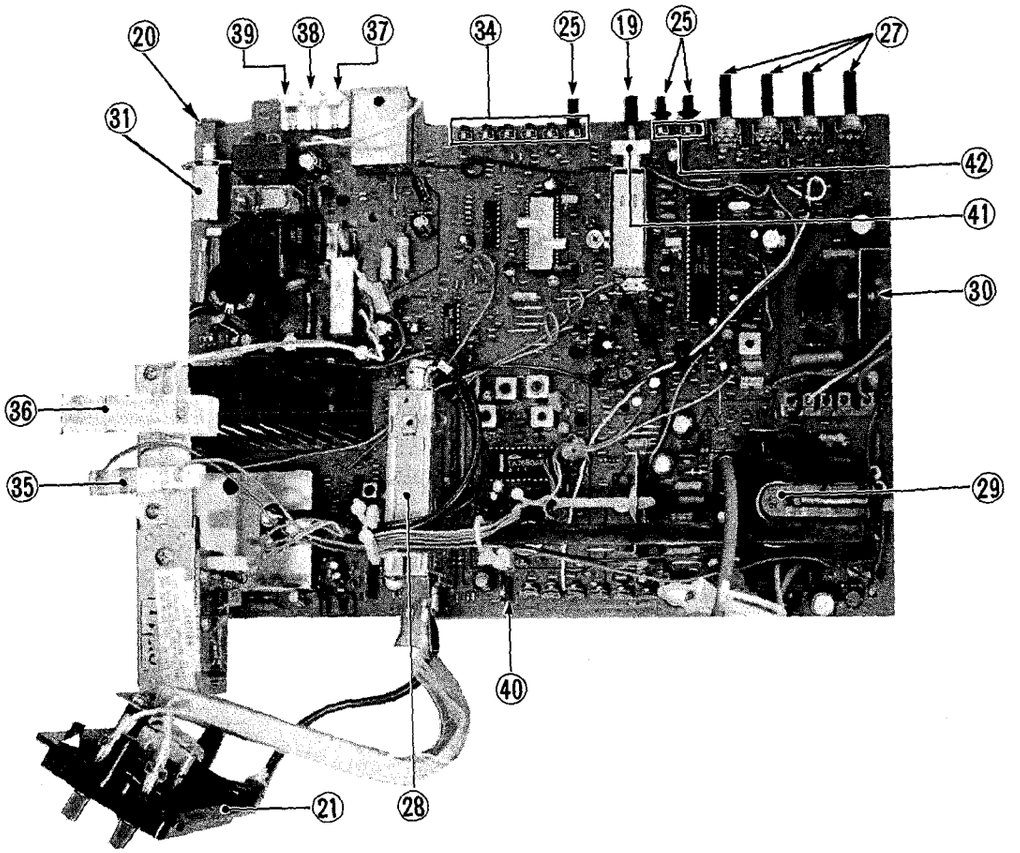
SX-9122A (SIDE PIN P.B. ASS'Y)

SYMBOL No.	⚠	PART No.	PART NAME	REMARK
RESISTOR				
R9532		QRF103K-180	UNF R	18Ω 10W K
CAPACITOR				
C9420		QETB1CM-228	E Cap.	2200μF 16V M

[CHASSIS AND CABINET PART]

*: Local Parts

VIEW No.	SYMBOL No.	*	⚠	PART No.	PART NAME	REMARK
1		*		CM10254-00F-M0	Front Cabinet Ass'y	
2		*		CM20478-005	Door	Within Front Cabinet Ass'y
3				A37963-BA	Rod Ant. Ass'y	
4				A31284-AS	UHF Loop ant.	
5				CM31077-00E-V0	Indicate Panel	
6				**CM31124-00F-V0**	Knob Ass'y	MAIN POWER
7				CM30861-001	Spring	KNOB Ass'y
8				CM41861-001	Door Latch	
9				CM41921-001	Brand Mark	
10				CE40801-002	Matching Box	
11				**HSA0899-01D-KD**	Speaker	
12				CM31108-003	Operation Sheet	
13	V01	*	⚠	**A48JPZ60X-AP**	Picture Tube	
14				A48457	Spring	(x2) PICTURE TUBE
15	L01		⚠	CJ39633-00A	Degaussing Coil	
16	DY01		⚠	**CE20078-A0A-KD**	Def. Yoke Ass'y	
17				A75034-B	PC Magnet	
18				CJ30033-00A	Wedge Ass'y	(x3)
19				CM41678-B01	Push Knob	SELECT/LOCK
20				CM41677-A01	Knob Cap.	POWER SWITCH
21			⚠	**CM31109-00P-KD**	ANT. Terminal Ass'y	
22		*		CM10256-001-M0	Rear Cover	
23		*		CM20003-022	Rating Label	
24				GBSB4016N	W Tap. Screw	(x7)
25				CM41887-001	Push Knob	(x3) ERASE, ADD, TV/CATV
26			⚠	**QMP1620-200R**	Power Cord	
27	(R1230,R1240 R1330,R1333)			**QVCA002-CB14M**	VR	(x4) TINT, COLOR, BRIGHT, PICTURE
28	UV1001		⚠	**AN7773EP-A04**	CATV Tuner	
29	T1522		⚠	**CE41039-00A-KD**	HV Transf.	
30	Q1522		⚠	2SD1555	Si. Transistor	or 2SD1427
31	S1901		⚠	**QSP4D11-C02**	Power Switch	MAIN POWER
32				CH30150-00E	Braided Ass'y	
33				N47971	Cord Clamp	
34	S1702~09			**QSP4H11-C03**	Push Switch	(x8) (POWER, CH, VOL., ADD, ERASE, TV/CATV)
35	R9532		⚠	QRF103K-180	UNF R	18Ω 10W K
36	R1905		⚠	QRF258J-161	〃	160Ω 25W J
37	D1706			SEL1910D	LED	SLEEP TIMER INDICATOR
38	D1710			LN31GCP-UH	〃	CATV INDICATOR
39	D1923			**GL-5PR2**	〃	MAIN POWER INDICATOR
40	S1201			QSL4A13-C02	Lever Switch	SERVICE
41	S1701			QST3101-C03	Push Switch	SELECT/LOCK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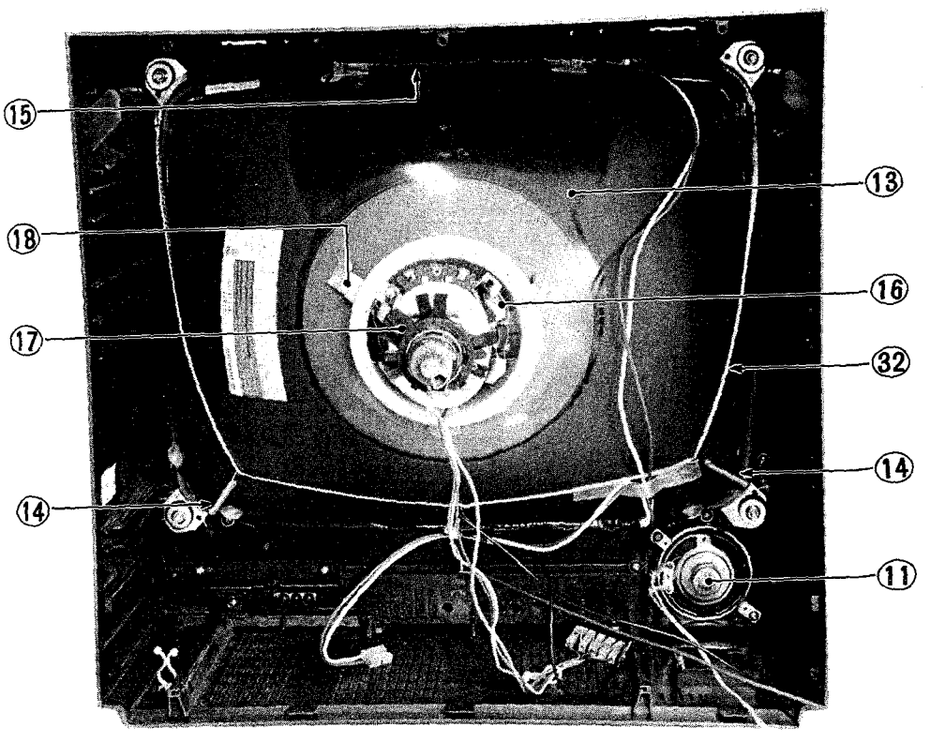
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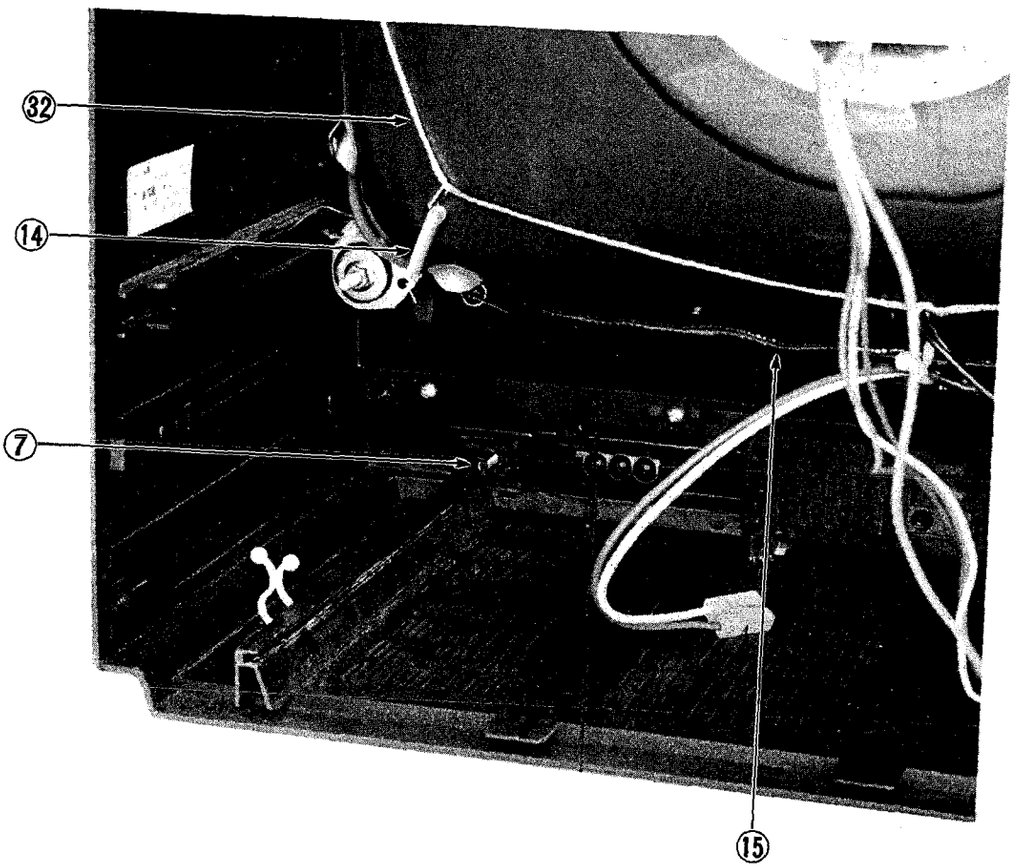
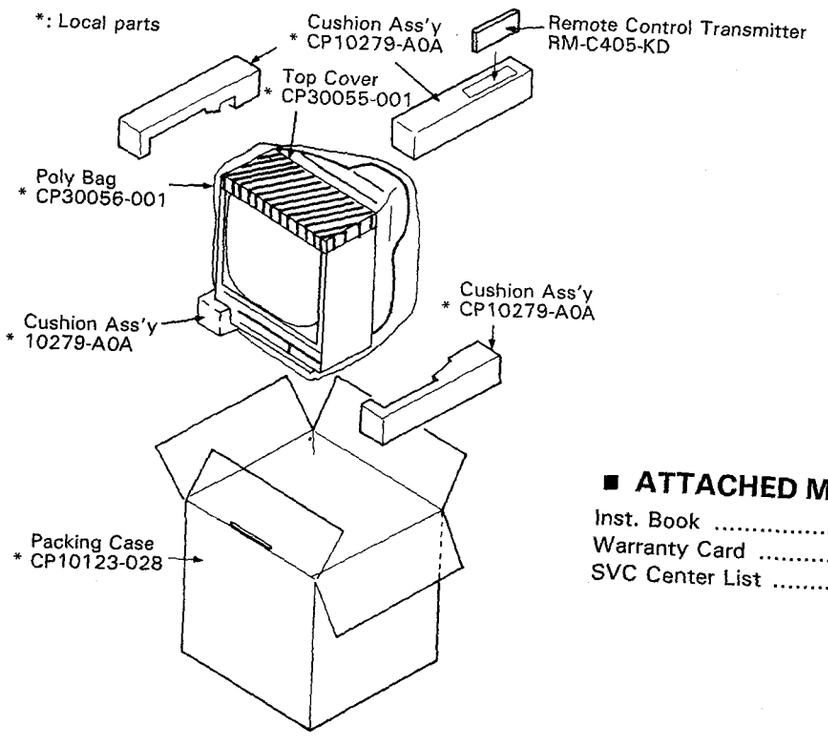


(PACKING DIAGRAM)



■ ATTACHED MATTERS

Inst. Book	C-1936-CA-IBA
Warranty Card	BT-20025H
SVC Center List	BT-20071A

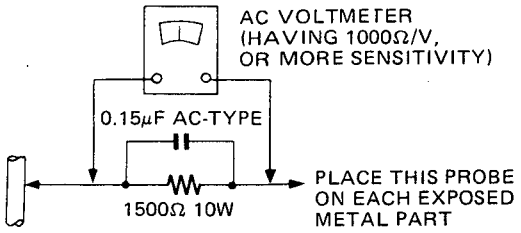
SAFETY PRECAUTION

1. The design of this product contains special hardware, many circuits and components specially for safety purposes.
   For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of receiver should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in television sets have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (⚠) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list in Service manual many create shock, fire, or other hazards.
4. **Use isolation transformer when hot chassis.**
   The chassis and any sub-chassis contrained in some product are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some product when the HOT chassis is exposed.
5. **Don't short between the LIVE side ground and NEUTRAL side ground when repairing.**
   Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE (primary: ⊥) side GND and the NEUTRAL (secondary: ⏚) side GND.
   Don't short between the LIVE side GND and NEUTRAL side GND or never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and NEUTRAL side GND at the same time.
   If above note will not be kept, a fuse or any parts will be broken.
6. If any repair has been made to the chassis, it is recommended that the B_1 setting should be checked or adjusted (See ADJUSTMENT OF B_1 VOLTAGE).
7. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approvided by the manufacturer of the complete product.
8. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.
9. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.
10. **Isolation Check**
    (Safety for Electrical Shock Hazard)
    After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, channel selector knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) **Dielectric Strength Test**
The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1,100V AC (r.m.s.) for a period of one second.
(. . . . . Withstand a voltage of 1,100V AC (r.m.s.) to an appliance rated up to 120V, and 3,000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)
This method of test requires a test equipment not generally found in the service trade.

(2) **Leakage Current Check**
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

- **Alternate Check Method**
  Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.).
  Measure the AC voltage across the resistor with the AC voltmeter.
  Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).



11. **High voltage hold down circuit check.**
    After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.
    See item **"How to check the high voltage hold down circuit".**

PURITY, CONVERGENCE AND WHITE BALANCE

*** The locations of SERVICE SWITCH, SCREEN VR, CUT-OFF VR and DRIVE VR are described in the ALIGNMENT LOCATION of the schematic diagram.**

PICTURE TUBE

The picture tube is a precision in-line gun type. For this picture tube, dynamic convergence is carried out by a precision deflection yoke which eliminated the use of convergence yoke and convergence circuit. The adjustment of picture tube is therefore made easier as only the adjustment of static convergence by using a magnetic is enough. The deflection yoke and purity/convergency magnets assembly has been set at the factory and requires no field adjustments.
However, should the assembly be accidentally jarred or tampered with, some or all adjustments may be necessary.

COLOR PURITY & VERTICAL CENTER

Loosen yoke retaining screw (Fig. B-1). With a sharp knife cut between the picture tube and the bond. Remove wedges completely and clean off dried adhesive from the picture tube. PAINT is used to lock the tabs of the purity/convergence magnet assembly in place (Fig. B-1). The paint must be removed with the end of a screwdriver before any adjustments are attempted.

As to models equipped with a magnet locking ring, beforhand loosen it.

1. Select no signal UHF channel.
2. Let the purity tabs come in line horizontally as is shown in Fig. B-2. A long tab should be in the same direction as the other short tab.
3. Move the yoke slowly backward.
4. Turn the GREEN CUT-OFF VR to maximum and the RED and BLUE CUT-OFF VR to minimum. Then adjust the SCREEN VR so that the green band can be seen best. (Fig. B-3.)
5. Rotate the two tabs in the opposite directions and with them kept at an angle, together in either direction so that the green band is centered on the picture tube.
6. Check the vertical center position by displaying a horizontal line. Unless correct, bring it to the center by rotating the two tabs, kept at an angle, together in either direction. (Fig. B-4)
7. Repeat steps 5 and 6 alternately until the green band and the vertical center come to the center.
8. Move the yoke slowly towards the bell of the tube so that the whole surface of the picture tube is filled with a green pure raster.
9. Turning RED or BLUE CUT-OFF VR to maximum and GREEN CUT-OFF VR to minimum, make sure of a red or blue pure raster.
10. Secure yoke retaining screw (do not install wedges at this time).

As to models equipped with a magnet locking ring, secure it and keep six magnets from moving even if it is touched slightly.

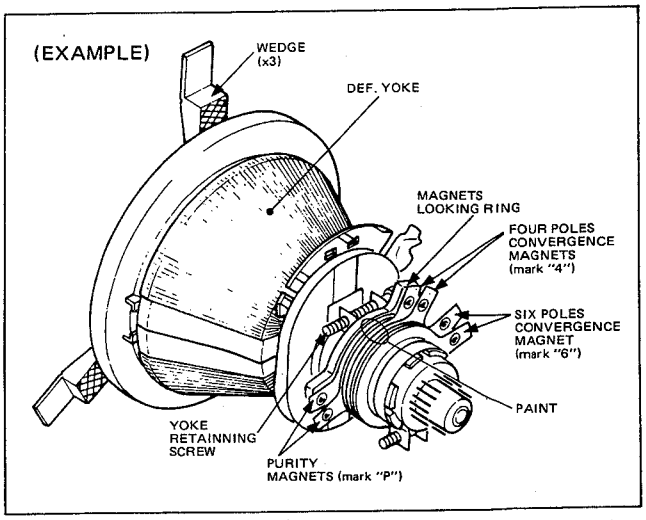


Fig. B-1

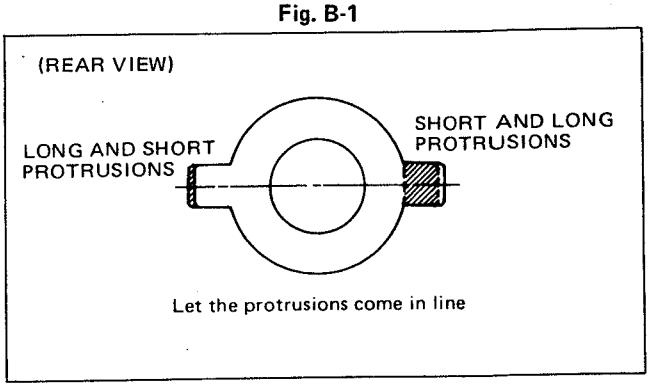


Fig. B-2

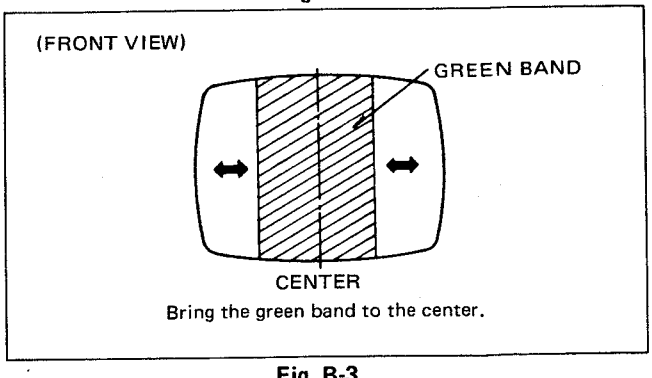
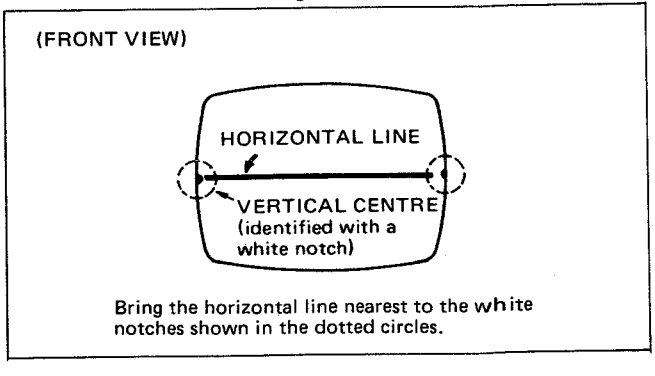


Fig. B-3


(FRONT VIEW)
HORIZONTAL LINE
VERTICAL CENTRE (identified with a white notch)
Bring the horizontal line nearest to the white notches shown in the dotted circles.

STATIC CONVERGENCE & DYNAMIC CONVERGENCE

1. Connect a crosshatch generator to the antenna terminals and adjust BRIGHTNESS and CONTRAST control for a distinct pattern.
2. Adjust the convergence around the edges of the picture tube by tilting the yoke, up-down and left-right, and temporarily install one wedge at the top of the yoke. (Fig. B-7, 8, 9)
3. Rotate the front pair of tabs (four pole convergence magnet) as a unit to minimize the separation of the red and blue lines around the center of the screen. To adjust the convergence of red and blue, vary the angle between the tabs. (Fig. B-5)
4. Rotate the rear pair of tabs (six pole convergence magnets) as a unit to minimize the separation of the magenta (R/B) and green lines. (Fig. B-6)
5. Adjust the spacing of the rear tabs to converge the magenta and green lines.
6. Apply paint to fix six magnets
   (As to models equipped with a magnet locking ring, tighten it.)
7. Remove the wedge installed temporarily on the yoke.
8. Tilting the angle of the yoke up, down and sideways, and adjust the yoke so as to obtain the circumference convergence. (Fig. B-8, 9)
9. Insert three wedges to the position as shown in Fig. B-10 to obtain the best circumference convergence.
10. Wedge has a backing of double sided adhesive tape. Therefore, tear off one side of adhesive tape, and fix the wedges.
11. White balance adjustment (Black & White tracking) can now be performed.

WHITE BALANCE ADJUSTMENT (Black and White Tracking)

1. Display a monochrome pattern.
2. Set the RED and GREEN DRIVE VR for their mechanical center.
3. Turn the RED, GREEN and BLUE CUT-OFF VRs and the SCREEN VR fully counterclockwise.
4. Display a horizontal line. (refer to "HORIZONTAL LINE")
5. Turn SCREEN VR slowly clockwise until a very faint horizontal line appears.
6. Turn the CUT-OFF VRs of the color which has appeared first, clockwise by about 10° and then adjust the SCREEN VR again so that the color may shine faintly.
7. Turn the other color CUT-OFF VRs slowly clockwise until a reasonable white line appears.
8. Return the monochrome pattern. (refer to "HORIZONTAL LINE")
9. Adjust the RED and GREEN DRIVE VRs for best white highlights.

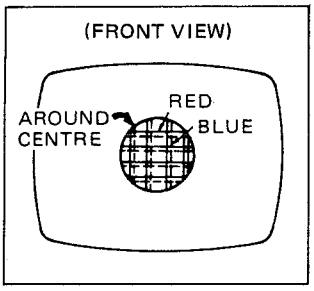


Fig. B-5

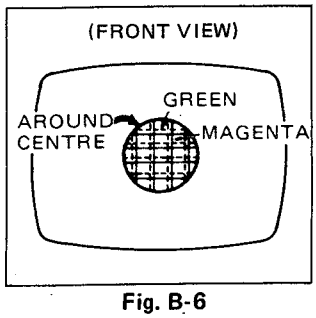


Fig. B-6

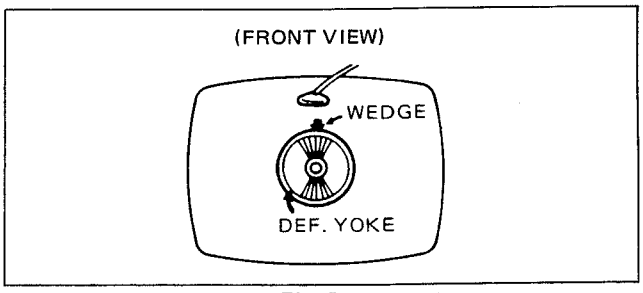


Fig. B-7

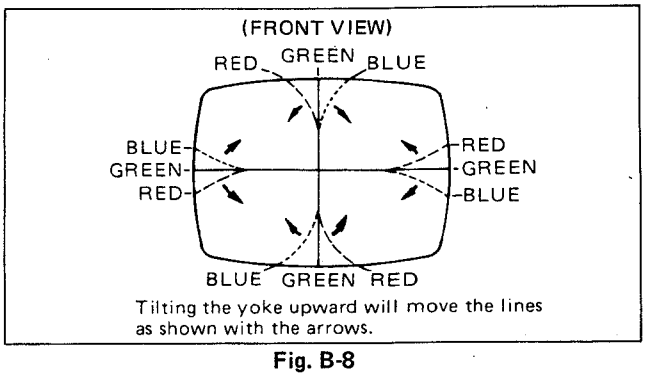


Fig. B-8

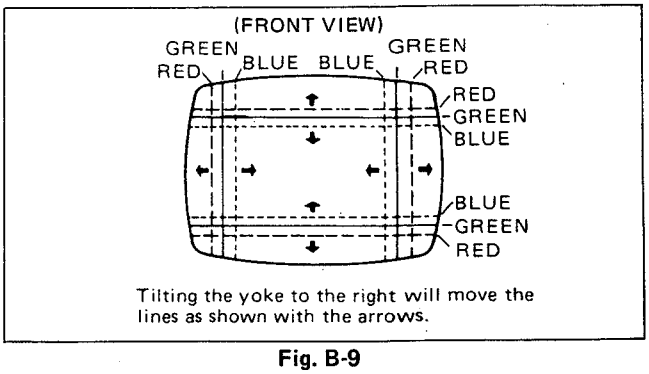


Fig. B-9

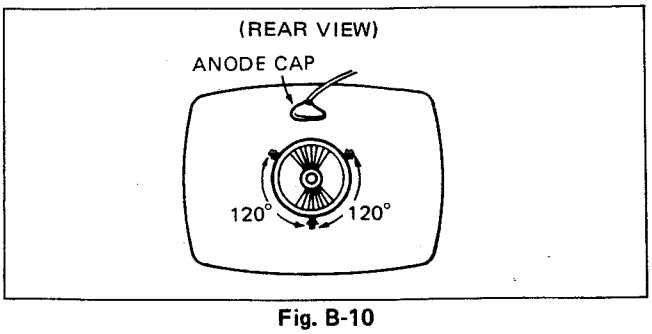


Fig. B-10

SERVICE ADJUSTMENTS

*** ADJUSTMENTS EXCEPT THE FOLLOWING DESCRIPTION ARE MENTIONED IN THE SERVICE MANUAL TEXT.**
*** SOME ITEM OF ADJUSTMENT METHOD IS NOT APPLICABLE TO SOME MODEL. IN SUCH A CASE OMIT THE ITEM.**
* Adjustments except the following description are mentioned in the service manual text.
* Use the undermentioned adjustment methods after repair or for readjustment of misadjustment.
* The locations of the under mentioned adjustment parts are described in the "Alignment Location" of the Schematic Diagram.
* Test point pins are not indicated in the printed circuit board, but in the Schematic Diagram under certain circumstances. In this case, look for test points, which are indicated in the Schematic Diagram, on the printed circuit board; and use it for test points even if there are not test point pins.

B_1 VOLTAGE

Confirm that B_1 voltage exists between TP-91 and GND.

NOTE

1. Some model's power circuit is partly different in the GND.
   The difference of the GND is shown by the LIVE (primary: ⊥) side GND and NEUTRAL (secondary: ⏚) side GND.
   In this case, use a suitable ground by checking whether LIVE side GND or NEUTRAL side GND in each schematic diagram.
2. **Use isolation transformer when hot chassis.**
   The chassis and any sub-chassis contained in some product are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some product when the HOT chassis is exposed.
3. The tester used should be periodically calibrated at 20kΩ/V.

SUB CONTRAST AND SUB BRIGHT

1. Set the CONTRAST, BRIGHT, PICTURE, and the COLOR knobs to the central position respectively (where they click).
   If STANDARD BUTTON provided, press it.
   (If EE SWITCH provided, Select the EE SWITCH OFF.)
2. Then align both the SUB CONTRAST VR and SUB BRIGHT VR until an ideal picture is obtained.

BLACK LEVEL AND SUB BRIGHT

- BLACK LEVEL and SUB BRIGHT VR are correlated. Do not adjust them carelessly.

1. Set the CONTRAST, BRIGHT, PICTURE and the COLOR knobs to the central position respectively (where they click).
   If STANDARD BUTTON provided, press it.
   (IF EE SWITCH provided, select the EE SWITCH OFF.)
2. Turn the BLACK LEVEL VR fully clockwise.
   Receive a high-contrast picture and adjust brightness with the SUB BRIGHT VR in the usual way.
   (Turn the SUB BRIGHT VR while observing vertical flyback line; stop turning it just before vertical flyback line turns black.)
3. Turn the BLACK LEVEL VR counterclockwise, and adjust it so that black objects appear pute black and vivid.
4. Confirm the adjusted status on every channel.

SUB TINT AND SUB COLOR

1. Set the CONTRAST, BRIGHT, PICTURE and the COLOR knobs to the central position respectively (where they click).
   If STANDARD BUTTON provided, press it.
   (If EE SWITCH provided, select the EE SWITCH OFF.)
2. Adjust the SUB TINT VR and SUB color VR to obtain human skin natural color.

SUB PICTURE

1. Set the CONT., BRIGHT, PICTURE and the COLOR knobs to the central position respectively (where they click).
   * If STANDARD BUTTON provided, press it. (If EE switch provided, select the EE SW, OFF).
2. Adjust the SUB PICTURE VR until an ideal picture is obtained.

3.58 MHz TRAP

1. Connect a color bar generator to the antenna terminal.
2. Connect oscilloscope probe to DELAY LINE output side.
3. Adjust the 3.58 MHz TRAP (T201) so that the 3.58 MHz signal is minimized. (Fig. C-1)

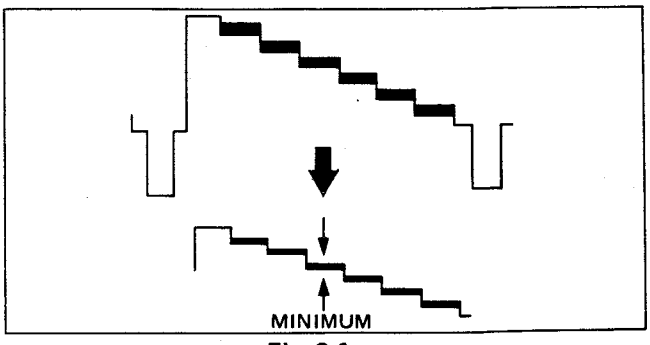


Fig. C-1

* Some item of adjustment method is NOT applicable to some model. In such a case omit the item.
* Adjustments except the following description are mentioned in the service manual test.
* Use isolation transformer when HOT chassis.

COMB FILTER

1. Connect a color bar generator to the antenna terminal.
2. Connect an oscilloscope to COMB FILTER "Y" output position (TP-42). Magnify the color signal portions of the color bar waveform so that the 3.58 MHz elements become easy to observe.
3. Adjust PHASE Transf. (T201 and T202), and minimize the 3.58 MHz elements.
4. Regulate the COMB FILTER adjustment VR to further minimize the 3.58 MHz elements. (Fig. C-1)
5. Repeat steps 3 and 4 to fully minimize the 3.58 MHz elements. (Fig. C-1)

VERTICAL HEIGHT AND LINEARITY

1. Set color bar generator to crosshatch or a pattern with which symmetry can be checked.
2. Reduce the vertical size with the VERTICAL HEIGHT VR.
3. Adjust the vertical symmetry with the VERTICAL LINEARITY VR.
4. Readjust the VERTICAL HEIGHT so that the picture extends to normal size.

VERTICAL HEIGHT

1. Set the color bar generator to crosshatch or pattern with which symmetry can be checked.
2. Adjust the vertical symmetry with the VERTICAL HEIGHT VR.

NOISE (RF A.G.C. Delay)

This control is set at the factory and rarely requires any adjustment. If a snowy picture appears on a medium to weak station adjust the noise control.

1. Turn control fully clockwise (or counterclockwise), maximum noise in picture.
2. Slowly turn VR counterclockwise (or clockwise) until snow or noise in picture just disappears.

   Note: Check operation on strong channels. If overloading occurs (bending, poor color, loss of color sync, etc.) make compromise adjustment.

4.5 MHz TRAP

1. Tune in a local color station preferably a program with the least amount of movement and continuous audio.
2. Adjusting the V. IF DET. OUT Transf. (T105) so that beating with sound signal disappears.

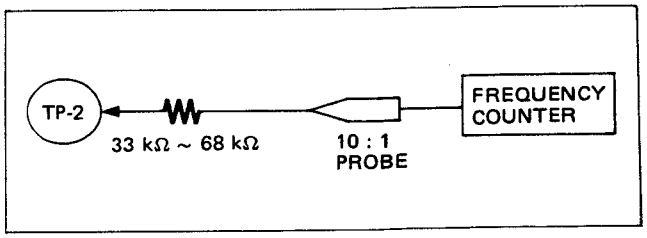
HORIZONTAL WIDTH

Adjust H. WIDTH control coil by turning it with a hexagonal adjusting bar only if RIGHT and LEFT sides of pictures can't be seen.

FOCUS

Adjust FOCUS VR for best overall definition and picture detail at normal brightness and contrast.

REFERENCE FREQUENCY OSCILLATOR



Connect as shown above and adjust C205 (ceramic trimmer capacitor) so that the oscillation frequency is 4500.000 kHz ± 20 Hz or receive UHF AIR at AFC OFF position and adjust C205 so that the AIR becomes just tuning.

HORIZONTAL OSCILLATOR

1. Set the H. FREQ. VR to the mechanical center position.
2. Connect the jumper clip between TP-33B and earth.
3. Adjust the H. FREQ. VR until picture is in view and locks or drift slowly back and forth.
4. Remove the jumper clip.
5. Make sure that the set maintains horizontal sync, when channels are switched.

COLOR SYNC.

1. Receive a color bar signal.
2. Connect two jumper wires between TP-50 and TP-E and between TP-51A and TP-51B.
3. While rotating a TRIMMER CONDENSER using a non-metallic screwdriver, adjust it until the horizontal striped patterns with color become stationary or are slowly moving.
4. Remove jumper clips.
5. Confirm that color sync is not disrupted when channels are switched.

H. CENTER

Centering is completed at the factory, although it may become distorted when CRT is changed.

In such case, selecting the H. CENTER SWITCH moves the picture left or right.

(Some model have H. CENTER TIP.)

VERTICAL CENTER

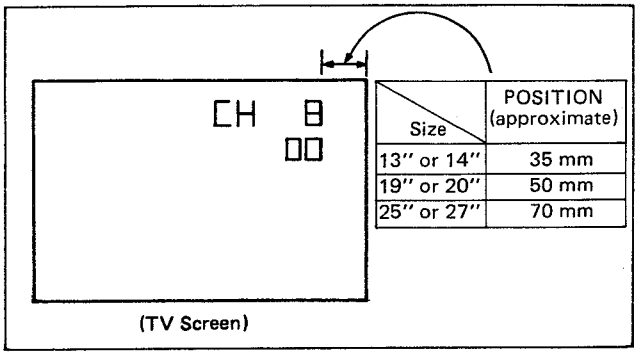
Centering is completed at the factory, although it may become distorted when CRT is changed.

In such case, selecting the V. CENTER SWITCH moves the picture up or down. (Some model have V. CENTER TIP).

* Some item of adjustment method is NOT applicable to some model. In such a case omit the item.
* Adjustments except the following description are mentioned in the service manual test.
* Use isolation transformer when HOT chassis.

ON SCREEN

1. Display characters on the screen.
2. As shown in the Fig. C-2, adjust the character positions with the CLK VR (On screen adj. VR).
3. Confirm that the characters are also located approximately at the same positions on other channels.



Size	POSITION (approximate)
13" or 14"	35 mm
19" or 20"	50 mm
25" or 27"	70 mm

Fig. C-2

■ V. IF

1. Connect a color bar generator to antenna terminal. (When the signal is too strong, use the attenuator.)
2. Connect DC voltmeter (or tester) between AGC terminal of E. Tuner and earth.
3. Rotate NOISE VR so that RF. AGC voltage becomes DC 4.5 V ± 1 V.
4. Adjust CW transformer so that the indicator becomes to minimum and also confirm that picture in optimum conditions is obtained.
5. Confirm the adjustment of NOISE VR.

HORIZONTAL LINE

- CUT-OFF SERVICE SWITCH
  Select the CUT-OFF SERVICE SWITCH from N to S and a HORIZONTAL LINE will appear.
  (When returning a monochrome pattern select the CUT-OFF SERVICE SWITCH from S to N and a monochrome pattern will appear.)

- CUT-OFF SERVICE TIP
  Reconnect the CUT-OFF SERVICE TIP from N to S and a HORIZONTAL LINE will appear.
  (When returning a monochrome pattern reconnect the CUT-OFF SERVICE TIP from S to N and a monochrome pattern will appear.)

- VIDEO CUT WIRER
  Connect a jumper wire between TP-35A and TP-35B, after removing the VIDEO CUT WIRE, and a monochrome pattern will appear.
  (Reconnect the VIDEO CUT WIRE to the normal position, after removing the jumper wire from TP-35A and TP-35B.)

■ RF. AFC

1. Connect a color bar generator to antenna terminal.
2. Adjust AFC transformer so that the voltage of TP-16 becomes DC 7.0 V ± 0.5 V.
   (Confirm to swing between about 9 V and 4 V previously.)

■ S. IF

1. Tune in a local station preferably a program with the continuous audio.
2. Adjust TAKE OFF Transf. (T601) and S. IF Transf. (T602) so that the sound becomes to maximum without distortion.

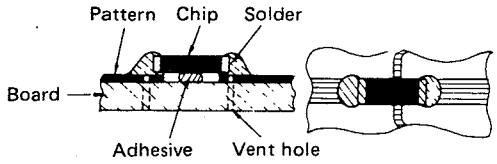
REPLACEMENT OF THE CHIP

* **CHIPS ARE NOT USED ON CERTAIN MODELS. REFER TO THE DESCRIPTIONS ON THIS PAGE ONLY WHEN WORKING ON MODELS ON WHICH CHIPS ARE EMPLOYED.**

* Replacement of the chip on printed circuit board can be performed easily as follows.

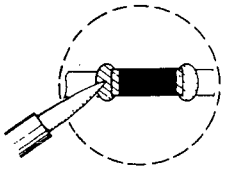
1 When mounted

[Resistor · Capacitor]

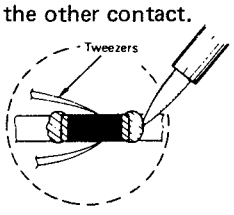


2 Removal of the chip

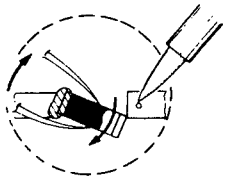
(1) Remove either of the soldered contacts.



(2) Hold the chip with tweezers and remove the other contact.



(3) Work the chip free from the adhesive with tweezers.

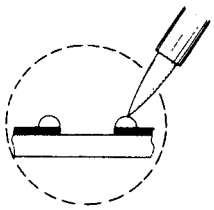


3 Preheating and soldering of chip pieces

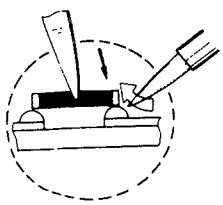
Be sure to preheat chip pieces (except the transistor) especially the capacitor before soldering with hot air, about 150°C (hair dryer or such can be used) for about 2 minutes. Then, immediately solder with an iron of about 30W.

4 Replacing the chip pieces

(1) Apply the solder to the board first.

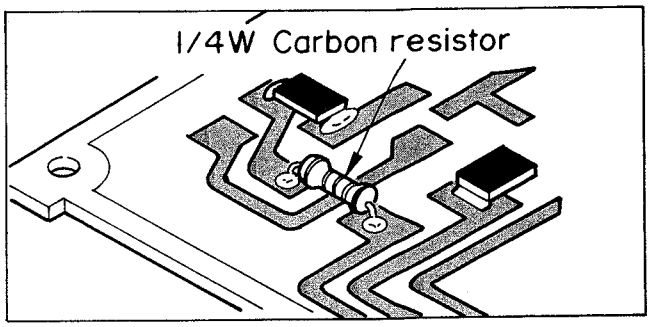


(2) Hold the chip with tweezers and solder it in place, hold the iron at a 45° angle when soldering.



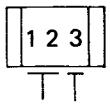
■ Discrete parts can be substitutionally mounted as shown in the figure on the right.
Mounting is also possible by passing the wires from the board front side (parts side) through the chip soldering hole (vent hole of registration part).
Substitute parts are as follows.

- Chip Metal Glaze Resistor
  → Carbon Resistor 1/4W ±5%
- Chip Ceramic Capacitor
  → Ceramic Capacitor 50V ±5%



■ **Decoding of chip parts constant terms**

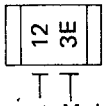
< Chip Metal Glaze Resistor >



Constant term: 12
Multiplier: 10^3

$12 \times 10^3 = 12000\Omega$
$= 12k\Omega$

< Chip Ceramic Capacitor >



K, M, Z, P . . . . Tolerance of ordinary type
C, P, R, S, T, U . . Temperature coefficient of temperature compensation type

Constant term: 12
Multiplier: 10^3

$12 \times 10^3 = 12000pF$
$= 0.012\mu F$

REPLACEMENT PARTS LIST INFORMATION

*** UTILIZE THE INFORMATION ON THIS PAGE IN COMBINATION WITH THE REPLACEMENT PARTS LIST. WHEN ORDERING REPLACEMENT PARTS PLEASE SPECIFY THE PART NUMBER AS SHOWN IN THIS LIST INCLUDING PART NAME, AND MODEL NUMBER. COMPLETE INFORMATION WILL HELP EXPEDITE THE ORDER.**

PRODUCT SAFETY NOTE
Components identified by the ⚠ symbol in the PARTS LIST and the shaded areas on the Schematic have special characteristics important to safety. Before replacing any of these components read carefully the SAFETY PRECAUTION on Page A of this Service Manual. DO NOT degrade the safety of the set through improper servicing.

1. ABBREVIATED WORD OF RESISTORS AND CAPACITORS

RESISTOR

C R	:	Carbon Resistor
Comp. R	:	Composition Resistor
OM R	:	Oxide Metal Film Resistor
V R	:	Variable Resistor
MF R	:	Metal Film Resistor
CMF R	:	Coating Metal Film Resistor
UNF R	:	Unflammable Resistor
F R	:	Fusible Resistor
CH MG R	:	Chip Metal Glaze Resistor

CAPACITOR

C Cap.	:	Ceramic Capacitor
M Cap.	:	Mylar Capacitor
E Cap.	:	Electrolytic Capacitor
BP E Cap.	:	Bi-Polar (or Non-Polar) Electrolytic Capacitor
MM Cap.	:	Metalized Mylar Capacitor
PP Cap.	:	Polypropylene Capacitor
MPP Cap.	:	Metalized PP Capacitor
PS Cap.	:	Polystyrol Capacitor
Tan. Cap.	:	Tantal Capacitor
CH C Cap.	:	Chip Ceramic Capacitor

2. FOLLOWING RESISTORS AND CAPACITORS OF STANDARD ELECTRICAL COMPONENTS ARE OMITTED FROM THIS PARTS LIST. EACH PART NUMBER OF THESE STANDARD REPLACEMENT COMPONENTS IS DEFINED AS FOLLOWS.

Carbon Resistor (C R): Lead form (—▯—)

Rating	Part No.
¼W	QRD141J-□□□ (CR — ¼W — Tolerance — Lead form — Constant term)
½W	QRD121J-□□□

Composition Resistor (Comp. R): Lead form (—▭—)

Rating	Part No.
½W	QRC121K-□□□ (Comp. R — ½W — Tolerance — Lead form — Constant term)

Mylar Capacitor (M Cap.): Lead form (⟋)

Withstand Voltage	Part No.
50V	QFM41HK-□□□ (M Cap. — Lead form — 50V — Tolerance — Constant term)
100V	QFM42AK-□□□
200V	QFM42DM-□□□

Ceramic Capacitor (C Cap.): Lead form (⟋)

Withstand Voltage	Parts No.
25V	QCS11EJ-□□□ (C Cap. — Lead form — 25V — Tolerance — Constant term)
50V	QCS11HP-□□□
500V	QCS12HP-□□□

Electrolytic Capacitor (E Cap.): Lead form (⟋)

Withstand Voltage	Parts No.
6.3V	QET40JR-□□□ (E Cap. — Lead form — 6.3V — Tolerance — Constant term)
10V	QET41AR-□□□
16V	QET41CR-□□□
25V	QET41ER-□□□
50V	QET41HR-□□□

Chip Metal Glaze Resistor (CH MG R)

Chip name	Chip No.	Substitutional Part No.
CH MG R	QRS148J-□□□ (CH MG R — 1/4W — Chip — Tolerance — Constant term)	QRD141J-□□□ CR 1/4W ±5%

Chip Ceramic Capacitor (CH C Cap)

Chip name	Chip No.	Substitutional Part No.
CH C Cap	QCS81HJ-□□□ (CH C Cap — Chip — 50V — Tolerance — Constant term)	QCS11HJ-□□□ C Cap 50V ±5%

3. DECODING OF TOLERANCE AND CONSTANT TERM

TOLERANCE

J: ±5% K: ±10% M: ±20% N: ±30% H: $^{+50}_{-10}$%

Z: $^{+80}_{-20}$% P: $^{+100}_{-0}$% R: $^{+30}_{-10}$% F: ±1%

CONSTANT TERM

• Carbon Resistor (¼W, ±5% Tolerance)

QRD141J-□□□
CONSTANT TERM.

1 R 0	→ 1.0Ω	47kΩ → 47 x 10³ → QRD141J-473
9 R 7	→ 9.7Ω	
1 0 □	→ 10□ means 10 x 10□ (Ω)	
8 2 □	→ 82□ means 82 x 10□ (Ω)	

• Ceramic Capacitor (50 Volts, ±5% Tolerance)

QCS11HJ-□□□
CONSTANT TERM.

1 R 0	→ 1.0pF	680pF → 68 x 10¹ → QCS11HJ-681
8 R 0	→ 8.0pF	3300pF → 33 x 10² → QCS11HJ-332
1 0 □	→ 10□ means 10 x 10□ (pF)	
8 8 □	→ 88□ means 88 x 10□ (pF)	

SCHEMATIC DIAGRAM

TUNER BAND	CHANNEL	IC831 BAND DATA A(3)	IC831 BAND DATA B(4)	TUNER TERMINAL B1	B2	B5	B4	BT
I	02~06(TV) A-8~A-3(CATV)	L	L	12.7V	3.9V	0V	0V	1V ↓ 27V
II	07~13(TV) A-2~A(CATV)	H	L	0.5V	12.2V	0V	0V	
III	S~W +29(CATV)	L	H	0V	0V	12.5V	0V	
IV	UHF 14~69	H	H	0V	0V	0V	12.7V	

UV001
AN7773EP
TV/CATV TUNER

IC831 LA7910 BAND SWITCH

IC801 μPD1709C-539
PLL MICRO PROCESSOR

Q831 2SK105(F)
ACTIVE FILTER

Q832 2SD637(Q,R)
ACTIVE FILTER

Q801
2SD637(Q,R)
PICTURE MUTE SW

Q802
2SD637(Q,R)
AUDIO MUTE SW

Q724
INVERTER

IC721 MN1483IJTZ
SENSOR CONTROL MICRO PROCESSOR

IC791
μPD4049UBC or TC4049BP
6-INVERTER

Q721 2SC1815(Y,GR)
V PULSE INVERTER

Q722 2SC1815(Y,GR)
H PULSE INVERTER

IC741 MN1228 MEMORY

IC742
TA78L05AP
REGULATOR

RM-C405
REMOTE CONTROL TRANSMITTER

Q04 2SD636(Q,R,S)DRIVE
Q05 2SB822R(Q,R)DRIVE

IC01 M50463P
DECORDER PULSE GENERATOR

Q120 2SC1360
PIF PRE AMP

Q101 2SA1015(Y,GR)
VIDEO AMP

IC101
TA7680AP
PIF & SIF

Q761, Q763
2SC1815(Y,GR)
ON SCREEN DRIVE

Q762 2SA1015(Y,GR)
ON SCREEN DRIVE

Q764 2SC1815(Y,GR)
VIDEO AMP

Q765 2SA1015(Y,GR)
VIDEO AMP

IC781
μPC1373H
PRE AMP

Q201
2SA1015(Y,GR)
AMP

Q202
2SC1815(Y,GR)
AMP

Q203
2SB642(Q,R)
SYNC. DET.

Q922
2SC3187
RELAY OFF DRIVE

Q921
2SC3187
RELAY ON DRIVE

IC901
STK563A(2/2)
S.OUT

IC901
STK563A(1/2)
130V POWER REGULATOR

IC201
μPC1401C
PICTURE CHROMA DEF

IC421 AN5515
VERT OUT

SX-3031A
CRT SOCKET PB ASS'Y

Q101~Q103
2SC1514VC

Q104
2SC3187
ON SCREEN

V01
A48JPZ
60X
PICTURE TUBE

DY01
DEF YOKE CEP0078

SX-9122A
SIDE PIN PB ASS'Y

Q521
2SC3187 or 2SC2482V or 2SC2610BK
H DRIVE

T522 HVM CE41039

Q522
2SD1427 or 2SD1555
H OUT

T521
HOT

Q321
2SC1815(Y,GR)
CONTROL

Q2204
2SA1015 (Y,GR)
COLOR MUTE

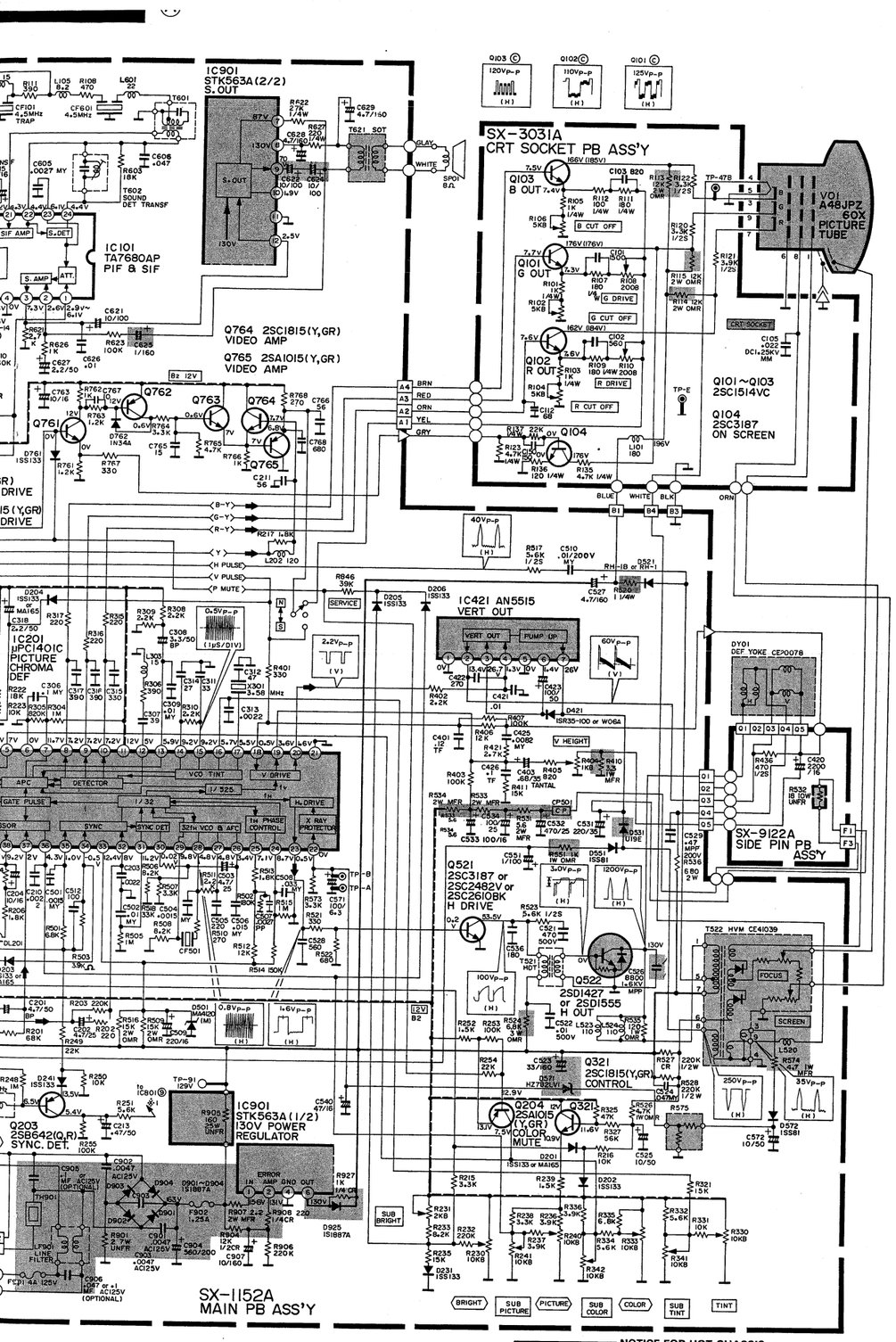
SX-1152A
MAIN PB ASS'Y

* USE ISOLATION TRANSFORMER WHEN REPAIRING.

NOTICE FOR HOT CHASSIS

The chassis and any sub-chassis contained in this product are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on this product when the HOT chassis is exposed.

JVC C-1936 (CA) SCHEMATIC DIAGRAM



NOTICE FOR HOT CHASSIS

The chassis and any sub-chassis contained in this product are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on this product when the HOT chassis is exposed.

NOTICE

The voltage reading and waveform ware measured at each point with a multi-meter and an oscilloscope while receiving a service color bar signal with a sufficient sensitivity. The measurements were made with each VR under the condition just after the shipment. The figures of the signal circuits may be more or less different after adjustments, so use the figures simply for reference.

Multimeter used
DC 20kΩ/V
Given figures are all DC voltages.
Sweep speed of oscilloscope
H → 20 μS/div. V → 5 mS/div.
Others → sweep speed specified

Since the schematic diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

SAFETY

FR (-WW-FR) denotes a fusible resistor which operates as a fuse. When replacing fusible resistors parts indicated with black shading (▬) in the circuit diagrams, be sure to ensure safety by using designated parts.
As to other parts too, use designated parts to maintain safety and performance.

INDICATION OF PARTS SYMBOL

Inside board (Example) SX-1152A : R1209 → R209
Outside board (Example) R0001 → R01

SCHEMATIC DIAGRAM INDICATION

Resistor

- Resistance value
  Without unit: [Ω]
  K : [kΩ]
  M : [MΩ]
- Rated allowable power
  Without indication : 1/6W
  Others Indicated
- Type
  Without indication : Carbon resistor
  OMR : Oxide metal film resistor
  UNF : Unflammable resistor
  MF R : Metal film resistor
  FR : Fusible resistor
  * Composition resistor 1/2 [W] is indicated as 1/2S or Comp.

Capacitor

- Capacitance
  Above 1 [pF] : Below 1 [μF]
- Withstand Voltage
  Without indication : DC 50 [V]
  Others : DC withstand voltage (V)
  AC indicated : AC withstand voltage (V)
- Indications for electrolytic capacitors are as follows.
  (Example)
  47/50 → capacitance [μF] / Withstand Voltage [V]
- Type
  Without indication : Ceramic capacitor
  MY : Mylar capacitor
  MM : Metalized mylar capacitor
  PP : Polypropylene capacitor
  MPP : Metalized polypropylene capacitor
  NP : Nonpolar electrolytic capacitor
  BP : Bipolar electrolytic capacitor
  TAN. : Tantalum capacitor

Coil

Without unit : [μH]

Power Supply (Respective voltage values are indicated)

▬▬ : B_1 Voltage (129V) ⊓⊓⊓ : (5V)
▬ ▬ : B_2 Voltage (12V)

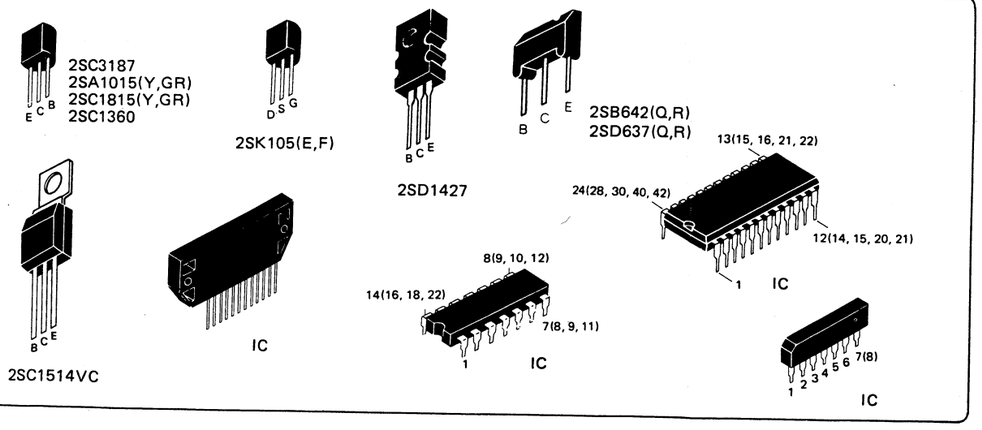
Test point & GND. symbol.

◉ : Test point by miniature GT pin
○ : Only test point display
⊥ : LIVE side ground
⏚ : NEUTRAL side ground

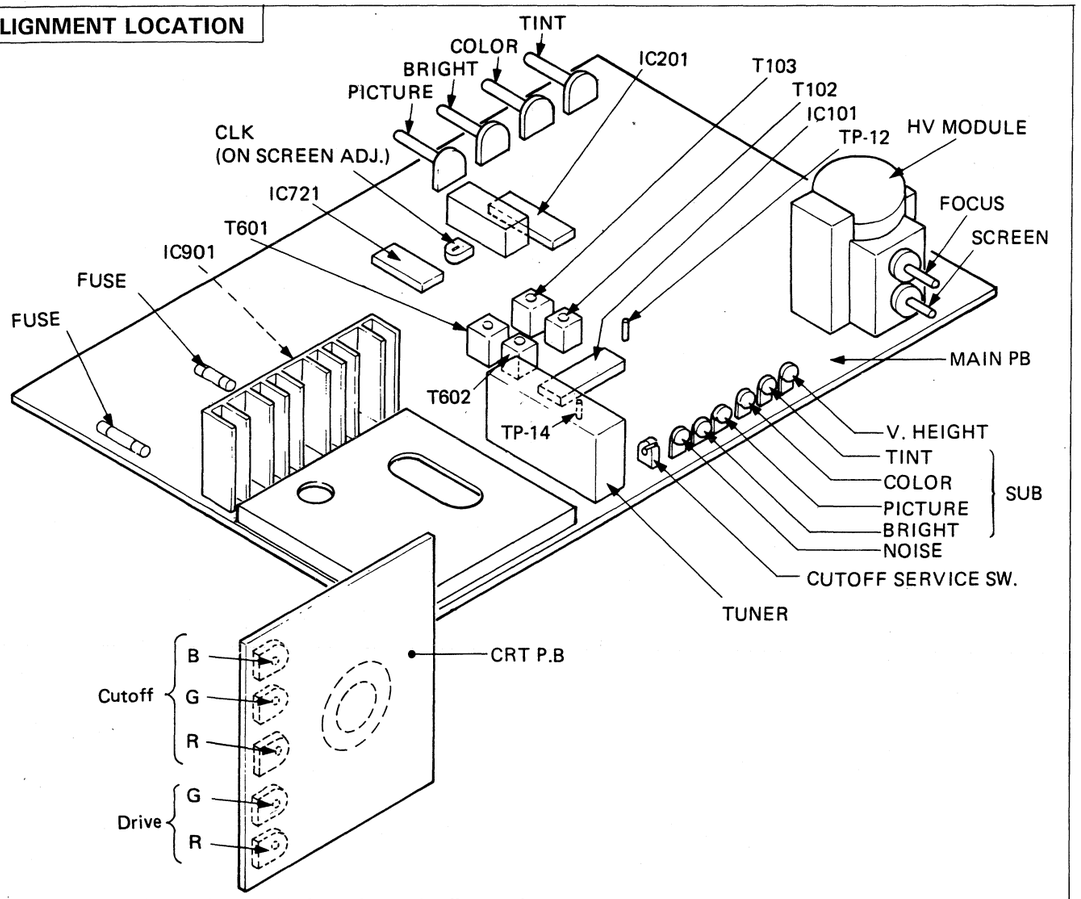
Connection method

▭ : Connector,
○ ○ : Wrapping or soldering
→ : Receptacle

■ BASINGS OF TRANSISTORS & ICs



ALIGNMENT LOCATION

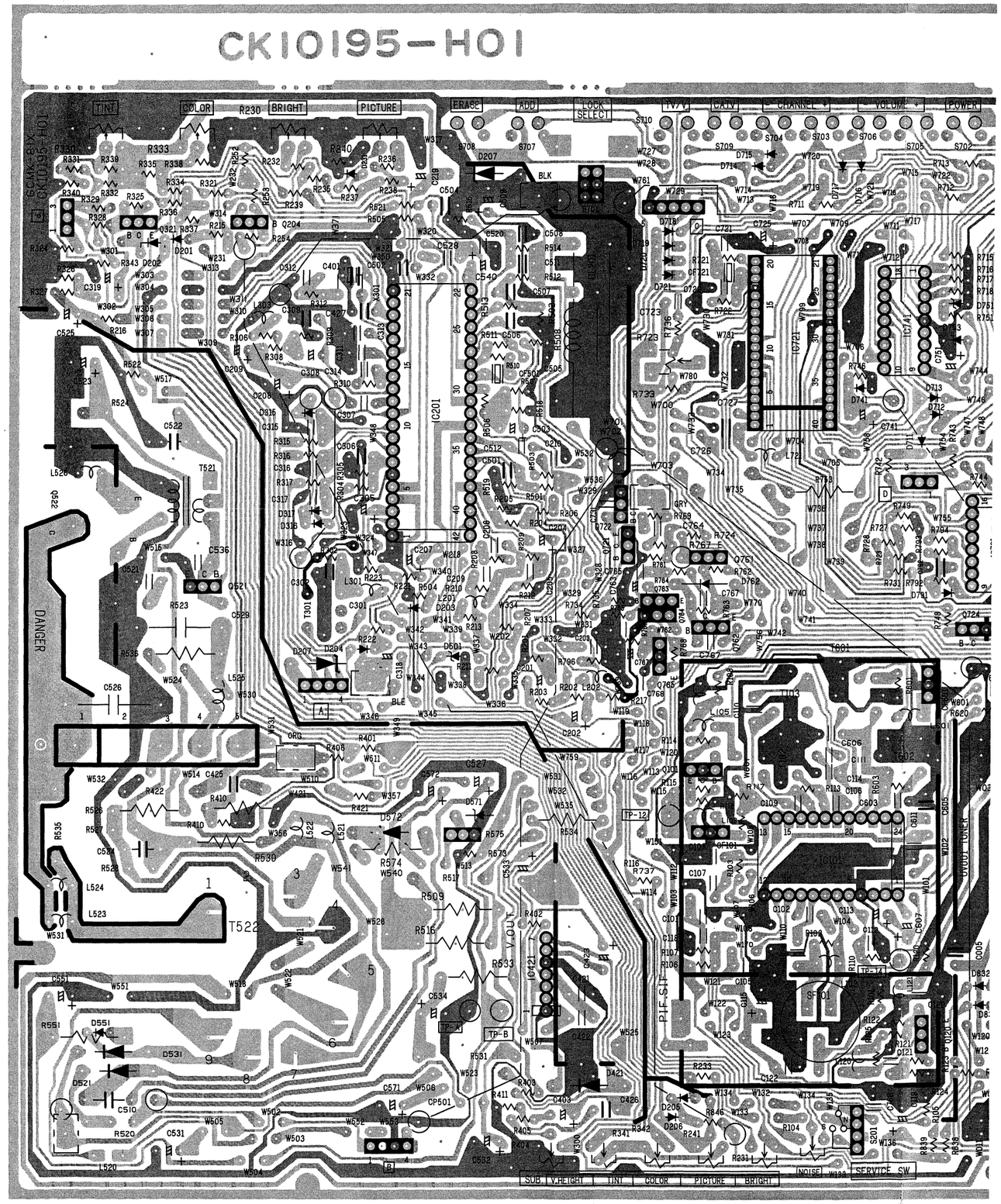


PARTS LIST (Shaded parts in the schematic diagram)

Symbol No.	Parts No.	Parts Name
MAIN PB ASS'Y		
R1001	QRD149J-5R6S	CR
1116	〃 -100S	〃
1410	QRX019J-3R3S	MF R
1520	QRD149J-1R0S	CR
1524	QRG039J-682A	OM R
1531	QRX029J-5R6	MF R
1533	〃 -5R6A	〃
1534	〃 -6R8A	〃
1551	QRG019J-102S	OM R
1574	QRX019J-4R7S	MF R
1575	CJ39622-00A	R Block
1840	QRG019J-101S	OM R
1901	QRF076K-2R0	UNF R
1904	QRD129J-123S	C R
1907	QRX029J-2R2A	MF R
1908	QRD149J-221S	C R
1921	〃 -102S	〃
1924	QRG039J-102A	OM R
1927	QRD149J-102S	C R
1925	QRG039J-102A	OM R
C1523	QET52CR-336	E Cap.
1526	QFZ0081-8801S	MPP Cap.
1622	QET52AR-106	E Cap.
1624	〃 -106	〃
1625	QET52CR-105Z	〃
1901～3	QCZ9025-472A	C Cap.
1904	QEU72DM-567M	E Cap.
1905	QFZ9025-104M	MF Cap.
1906	〃 -104M	〃
L1520	CJ39509-048	Choke Coil

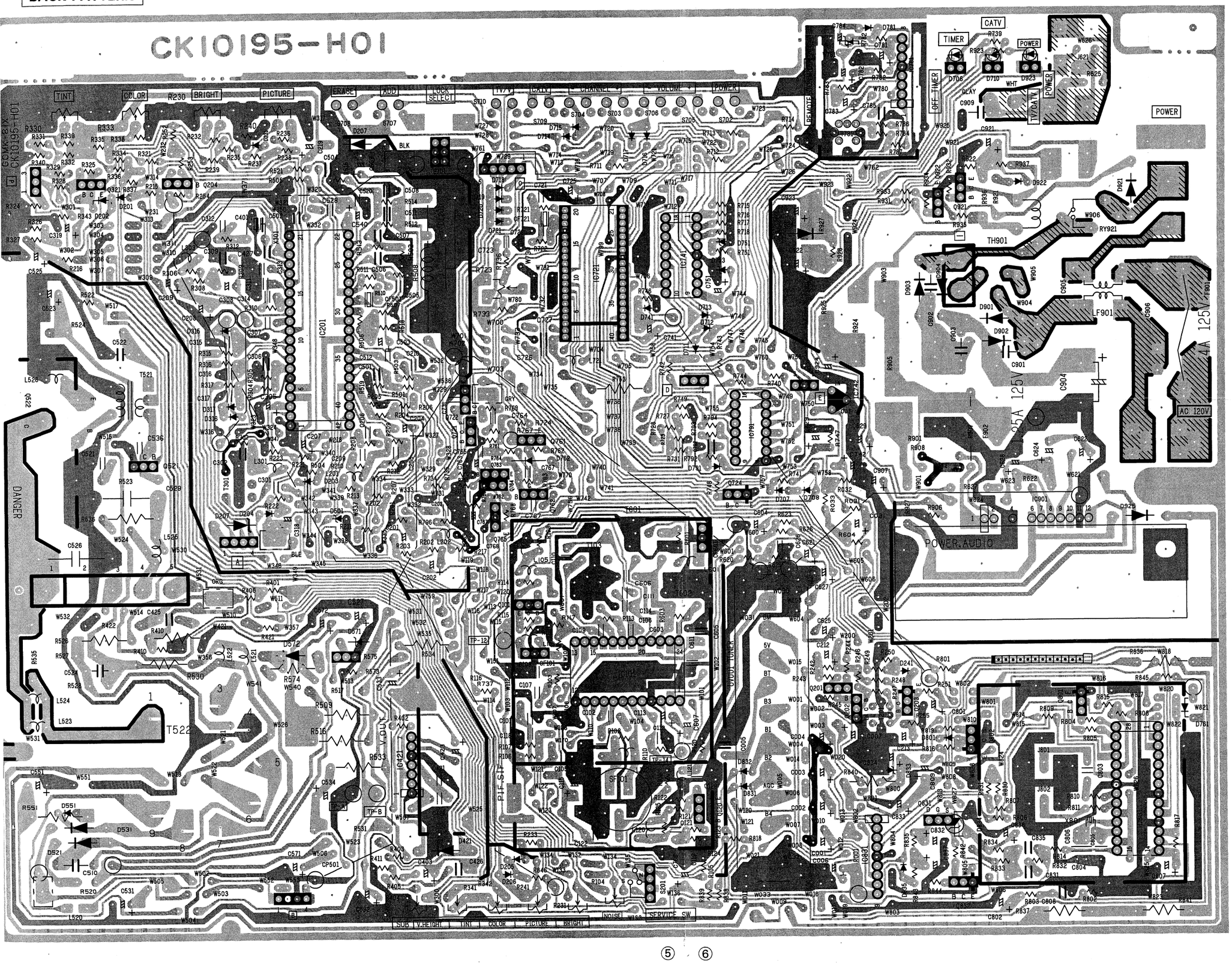
Symbol No.	Parts No.	Parts Name
T1621	C39130-A	S O T
D1531	U19E-F	Si. Diode
1571	HZ7B2LV1	Zener Diode
1901～4	1S1887A-Z	Si. Diode
1921,5	1S1887A-Z	〃
Q1522	2SD1555	Si. Transistor (or 2SD1427)
IC1201	μPC1401C	IC
1421	AN5515	〃
1742	TA78L005AP	〃
1901	STK563A	〃
S1901	QSP4D11-C02	Power Switch
LF1901	CE40248-00A	Line Filter
TH1901	A75414	Posistor
RY1921	CE40508-00B	Relay
F1901	QMF66U1-4R0S	Fuse
F1902	QMF53U1-1R25S	〃
CP1501	ICP-F15	IC Protector
UV1001	AN7773EP-A04	CATV TUNER
CRT SOCKET PB ASS'Y		
	A75522-D	CRT Socket
R3115～15	QRG029J-123	OM R
OUTSIDE OF PCBs		
V01	A48JPZ60X-AP	Picture Tube
L01	CJ39633-00A	Degaussing Coil
DY01	CE20078-A0A-KD	Def. Yoke Ass'y
	QMP1620-200R	Power Cord
T1522	CE41039-00A-KD	HV Transf.
R1905	QRF258J-161	UNF R
	CM31109-00P-KD	ANT. Terminal Ass'y
R9532	QRF103K-180	UNF R

BACK PATTERN



BACK PATTERN

CK10195-H01



CHANNEL CHART					
MODE			CHANNEL		TUNER BAND
T V	CATV	BAND	REAL	DISPLAY	
○	○	VL	02	02	I
			03	03	
			04	04	
			05	05	
			06	06	
		VH	07	07	II
			08	08	
			09	09	
			10	10	
			11	11	
			12	12	
			13	13	
		MID	A	14	
			B	15	
			C	16	
			D	17	
			E	18	
			F	19	
			G	20	
			H	21	
			I	22	
		SUPER	J	23	
			K	24	
			L	25	
			M	26	
			N	27	
			O	28	
			P	29	
			Q	30	
			R	31	
			S	32	
			T	33	
			U	34	
			V	35	
			W	36	
		HYPER	W+1	37	III
			W+2	38	
			W+3	39	
			W+4	40	
			W+5	41	
			W+6	42	
			W+7	43	
			W+8	44	
			W+9	45	
			W+10	46	
			W+11	47	
			W+12	48	
			W+13	49	
			W+14	50	
			W+15	51	
			W+16	52	
			W+17	53	
			W+18	54	
			W+19	55	
			W+20	56	
			W+21	57	
			W+22	58	
			W+23	59	
			W+24	60	
			W+25	61	
			W+26	62	
			W+27	63	
			W+28	64	
			W+29	65	
		VL	A-7	93	I
			A-6	94	
		SUB MID	A-5	95	
			A-4	96	
			A-3	97	
			A-2	98	II
			A-1	99	
		VL	A-8	01	I
○	×	UHF	14 ~ 69		IV
TOTAL 128CH			VHF 72CH UHF 56CH		

NOTE: TO RECEIVE THE SUBSCRIPTION OR PREMIUM PROGRAMMING FROM CERTAIN CABLE COMPANIES, SPECIAL ADAPTERS MAY BE REQUIRED.

6. HOW TO REMOVE FOR SERVICE

REMOVING THE REAR COVER

1. Unplug the power supply cord and unscrew the seven screws Ⓐ shown in Fig. 6-1.

REMOVING THE MAIN P.C. BOARD

After removing the rear cover

1. Spread out the two claws Ⓐ show in Fig. 6-2 and the SIDE PIN Board Ass'y can be removed.
2. Then remove the anode wire and other wires (if necessary) from the wire clamp.
3. Withdraw the Main P.C. Board backward along the rail.

* When conducting a check with power supplied, be sure to confirm that the CRT earth wire is connected to the CRT socket board and the main P.C. Board.

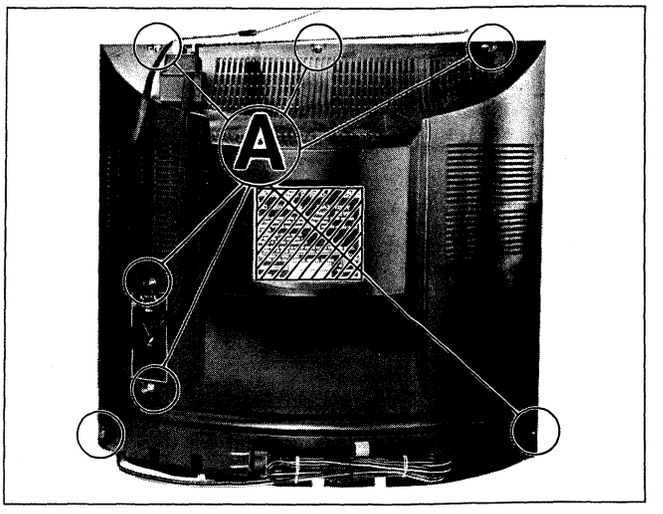


Fig.6-1

■ WIRE CLAMPING AND TYING BAND

1. Be sure to clamp the wire.
2. Never remove the tying band used for wire clamping. Should it be inadvertently removed, be sure to clamp the wire again, using insulating material.

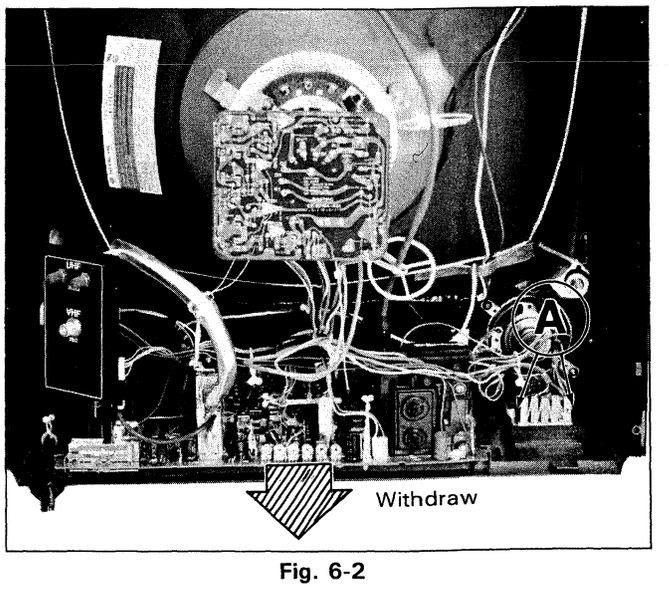


Fig. 6-2